C 55.220/2-3.992

WORLD DATA CENTER A
Oceanography

PENNSYLVANIA STATE UNIVERSITY
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CATALOGUE OF DATA

CHANGE NOTICE NOS. 48 and 49

WDCA-OC-92-2

World Data Centers conduct international exchange of geophysical observations in accordance with the principles set forth by the International Council of Scientific Unions. WDC-A is established in the United States under the auspices of the National Academy of Sciences.

WORLD DATA CENTER A
Oceanography

CATALOGUE OF DATA

CHANGE NOTICE NOS. 48 AND 49
(1 JANUARY- 31 DECEMBER 1991)

WORLD DATA CENTER A
Oceanography
Washington, D.C.

November 1992

ABSTRACT

This change notice lists and describes all data received by WDC-A, Oceanography during the period 1 January - 31 December 1991. It supplements the original six-volume Catalogue of Data, which includes Change Notice Nos. 1-16. The types of data catalogued include oceanographic station data, bathythermograph data, current measurements, biological observations, meteorological observations, and sea surface measurements. An Alphabetical Index of ship names and a Geographical Index of ocean areas assist the user in selecting the required data. Publications are cross referenced by accession number with the WDC-A Catalogue of Accessioned Publications.

NOTE: Country identification numbers used in this publication do not necessarily reflect recent realignments of nations' territorial boundaries and political subdivisions.

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Cooperative Institute for Research in Environmental Sciences
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World Data Center A,
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PREFACE

The six-volume Catalogue of Data and the loose-leaf Change Notice Nos. 1-16, which have been integrated into the Catalogue, now list all oceanographic data received by World Data Center A, Oceanography, from July 1957 through June 1975. The Catalogue has a loose-leaf arrangement of sheets, which have been punched for standard three-ring binders. It includes station location charts for many cruises.

Beginning with Change Notice No. 17, each Change Notice is printed in a modified format as a separate, bound publication describing all data received during a particular six-month or one-year period. The six-volume Catalogue of Data, including Change Notice Nos. 1-16, continues to serve as a reference volume for data received from July 1957 through June 1975. Provision has been made in the modified format for correlating newly received data for a particular cruise with data previously received for that same cruise and already described in a prior Change Notice.

The capability for identifying those data, which have been machine-processed by a national, regional, or responsible national oceanographic data center, has been retained in the modified catalogue format. In addition, this format provides a column for listing the catalogue number from the WDC-A, Oceanography, Catalogue of Accessioned Publications, thus identifying the published report in which the referenced data appear.

Data gathered before the beginning of the IGY in 1957 are not usually catalogued by the World Data Centers. However, extensive collections of pre-IGY oceanographic data gathered by various countries are available through the facilities of this Center. These data for the most part are oceanographic serial station data, surface and related data available in automated form. Machine listings and magnetic tapes containing these data can be prepared upon request.

WDC-A, Oceanography, welcomes suggestions for improved ways to present information in the Change Notices to the Catalogue of Data. It will make every effort to promptly correct any cataloguing error or omission brought to its attention.

INTRODUCTION

The World Data Center system was established in 1957 to collect data from the numerous and widespread observational programs of the International Geophysical Year (IGY) under the principles set forth by the International Council of Scientific Unions (ICSU) and to make such data readily accessible for an indefinite period of time to interested scientists and scholars. The system consists of World Data Center A (WDC-A) located in the U.S.A.; WDC-B located in the U.S.S.R.; WDC-C located in Western Europe and Japan; and WDC-D located in the People's Republic of China. WDC-A is established under the auspices of the U.S. National Academy of Sciences, where the Coordination Office is located. WDC-A is divided into nine discipline subcenters whose addresses are given on pages iv and v. These centers are located in institutions which, in the opinion of the Academy, can best serve the interests of science because of their data-handling capabilities for the appropriate scientific disciplines. WDC-A, Oceanography, is collocated with the National Oceanographic Data Center (NODC) in Washington, D.C.

After completion of the IGY program, ICSU delegated the responsibility for the operation of the World Data Centers to its Comite International de Geophysique (CIG) and subsequently to the ICSU Panel on World Data Centres. The framework for continued international exchange of oceanographic data is set forth in ICSU's Guide to International Data Exchange through the World Data Centres and the Intergovernmental Oceanographic Commission's (IOC's) Manual on International Oceanographic Data Exchange.

The types of oceanographic data desired for inclusion in the World Data Center system are those from Declared National Programs (DNP's) and international cooperative expeditions. DNP's are those for which a nation intends to exchange the resulting data internationally. Data are to be exchanged internationally in accordance with provisions of the IOC's Manual and the ICSU Guide. Lists of National Oceanographic Programs (NOP's) are compiled by the various national committees on oceanography and submitted to the Intergovernmental Oceanographic Commission for dissemination.

Contributors of oceanographic data to the World Data Center system and national committees on oceanography are urged to compare the Catalogue of Data with their Declared National Programs published in IOC information documents to determine whether the cruises actually completed agree with those listed and to ensure that the data resulting from them are transmitted to the World Data Centers in the manner prescribed by the IOC Manual and the ICSU Guide. Data need not be limited to those represented by DNP's or NOP's; WDC-A, Oceanography, welcomes additional data that fall within the framework of the ICSU Guide and the IOC Manual and that contributors may wish to include in the World Data Center system.

HOW TO USE THE CHANGE NOTICE TO THE CATALOGUE OF DATA

Catalogue Numbering System

The catalogue numbering system uses groups of numbers and letters to designate identifying references for purposes of data archiving and retrieval. A catalogue number consists of numerals for the assigned: series, country, institution, ship and cruise.

Series -- The catalogue numbering system is divided into basic groups called series. At present, these consist of the 100 series for data from ships and other mobile platforms and the 200 series for data from shore and fixed stations in the following categories:

a. Coastal and island stations.
b. Near shore manned stations; i.e., lightvessels and platforms.
c. Offshore manned stations; i.e., ocean weather ships.
d. Unmanned stations; i.e., automatic buoys.
e. Stations on shipping routes.
f. Offshore reference stations visited regularly.
g. Cables in use for oceanographic observations.
h. Repetitive drifting observations; i.e., ice islands, drifting buoys.

Country -- A list in the Indexes section includes all countries and institutions from which this Center has received data during this period together with their discrete identifying numbers. The series and two-digit country number comprise the first three digits of the catalogue number.

Example: For country number 1, Argentina, data from ships and mobile platforms are catalogued as 101, and data from shore and fixed stations as 201.

NOTE: The designations of countries used in this catalogue do not imply the expression of any opinion whatsoever on the part of this Center concerning the legal status of any country or territory, or of its authorities, or concerning the delineation of the frontiers of any country or territory.

Institution -- An institution which contributed data, either directly or through its designated national agency or national, regional or specialized oceanographic data center, is assigned a decimal number following the series/country number.

Example: The number 101.01 is assigned to data taken by ships and mobile platforms and received from the Argentine Servicio de Hidrografia Naval, and the number 201.01 is assigned to data taken at shore and fixed stations and received from the same institution.

Ship -- Each ship, or in some instances a group of ships operating together, is assigned a letter following the series/country/institution number. The letter is followed by a number assigned to the particular cruise as the data are received.

NOTE: The term "cruise" is used in this catalogue to define, whenever possible, the beginning and ending dates of a series of data collected by a ship, usually identified by the contributing institution with a cruise name and/or number. Sometimes it is necessary to group together several series of data from one or more ships under one catalogue number.

Example: The first cruise data received from the Argentine Servicio de Hidrografia Naval are from the ship CAPITAN CANEPA, which is assigned the letter A, followed by the number 01, thus A-01; the second cruise is A-02, the third A-03, etc. Thus, the catalogue numbers 101.01 A-01, A-02, A-03, etc.

A similar system is used in the 200-series for ships but is not applied to lightvessels and fixed shore stations; for the latter the ship/cruise identifier is omitted. For these categories, the series/country/institution numbers are given, but the lightvessel's or station's name must be added instead of the ship/cruise number to complete the catalogue identification.

Example: The Canadian station at Triple Island is identified as: 206.03 Triple Island.

A shore station is listed under the country in or near whose territory it is located. If observations are carried out and the data contributed by an institution of another country, the observing country's name and institution are listed after the name of the country of location.

How to Use the Alphabetical Index

1. Look up the name of the ship or fixed station in the Alphabetical Index where the related country/institution/ship catalogue numbers are listed.

2. Look up, under the respective countries, the indicated Catalogue Numbers.

How to Use the Geographical Index

1. Obtain the geographic area number and name from the Geographical Index Charts.

2. Look up the list of catalogue numbers of available data for the area in the Geographical Index.

3. Use these catalogue numbers to locate information about the types and amount of data available.

How to Obtain Data from WDC-A, Oceanography

When communicating with the Center for additional information concerning data, always refer to the specific catalogue numbers for data of interest to you. The catalogue numbers are designed to speed the identification and retrieval of the information or data you need.

Address all correspondence to:

Director
World Data Center A, Oceanography
National Oceanic and Atmospheric Administration
Washington, D.C. 20235, U.S.A.

If you telephone, the area code is 202.

The Associate Director's number is 606-4571.
The Data Archives number is 606-4571.

If you wish to visit the Center, its office hours are from 6:30 a.m. to 4:00 p.m., Monday through Friday. The Center is not open on Saturdays, Sundays, and U.S. national holidays. If you wish the use of study space, you should, if possible, give the Center a day or two advance notice so that necessary arrangements can be made. There is no charge for the use of study space.

Data Exchange Policy of World Data Center A, Oceanography

World Data Centers are held responsible for the provision of data and information to qualified requesters in the scientific community either in exchange or at a cost not to exceed that of processing and shipping. Unless a requester specifies otherwise, the Center is responsible for using the method which most satisfactorily reproduces the data or information item at the least cost. For certain types of requests, limitations in funding, personnel, or facilities may preclude direct or free provision of data or information by the World Data Center.

Data exchanges between WDC-A, Oceanography and WDC's in the same discipline usually take place without charge for routine exchanges of mutually agreed-upon types of data received by WDC-A in internationally-approved data exchange formats and in readily reproducible media forms. Non-standard data types are not normally exchanged. The ICSU Panel has now recognized that it is not always economically feasible to copy large data sets from one WDC to another. For certain types of data, the exchange of inventories of available data in a WDC subcenter may be considered acceptable in lieu of the transfer of the actual data sets.

In general, reasonably-sized requests from national or regional contributors to WDC-A, Oceanography may be considered as exchange, and equivalent data thus provided to the requester without charge. For requests for unusually large amounts of data, for specially formatted data, for derived data products, or for data to be obtained from outside the WDC system, WDC-A will normally be required to recover the costs of processing and shipping, or, at its discretion, may arrange for the request to be serviced by an RNODC or a regional, national, or disciplinary center. WDC-A may serve as an intermediary or coordinator for requests for unique types of data or data in other disciplines by placing the originator of the request in contact with the appropriate institution or disciplinary center.

Normally, WDC-A, Oceanography considers its data exchange commitment with a cooperating Data Center to be limited to the servicing of those requests or routine updating requirements intended to build or enhance standard data bases operated by that Center for specific, mutually agreed-upon data types and geographical areas of national or scientific interest. If the availability of funding and resources permit, WDC-A also attempts to assist such cooperating Data Centers when they require special data sets for institutions that are performing project-related research for international climate and global change programs and/or that have historically contributed data to WDC-A, Oceanography through that Data Center. WDC-A, Oceanography is obliged, in any case, to follow the exchange and cost recovery policies of its sponsoring (funding) government agency, while attempting to maintain consistency with data exchange guidelines of the ICSU Panel on WDC's as published in the ICSU Guide.

Data and information may be requested from WDC-A, Oceanography through NODCs, Designated National Agencies, or any other organization identified by national or international initiatives as responsible for communication with the World Data Centers. These materials may also be requested directly from WDC-A, Oceanography. Organizations, institutions, or individuals from Member States of the IOC may apply to the IOC Secretariat or UNESCO for possible assistance in funding their projects.

Data Centers or institutions in the international community that have acquired an automated data set or specialized data product from WDC-A must be aware that the original data set may be updated from time to time, errors corrected, or spurious data deleted by the originating data center. Where duplicate data sets are deliberately held in this way, the holder is responsible for making regular contact, as required, with the originating center to check whether the old data set is still valid, whether it should be deleted, or whether new data are available. WDC-A bears no responsibility in the conduct of these arrangements, except as regards the provision of information in its role as a coordination and referral center.

Acknowledgment of Data Sources

In many instances, data contributed to the Center are unpublished at the time of receipt. Unpublished data can be identified in the Change Notice by the absence of a publication number in the column entitled Data Center Reference Number. Accordingly, as stipulated by the Guide, recipients of copies of such data from the Center are reminded that the rights of the original investigators must always be respected. Thus, it is requested that if any data supplied by Center are published, due acknowledgment be made of the institution which undertook the original observations. To facilitate proper acknowledgment, the Change Notice indicates the originating institution.

PART I

CATALOGUE INDEXES

EXPLANATION OF THE ALPHABETICAL INDEX OF SHIPS AND FIXED STATIONS

This index presents in alphabetical order the names of the ships, lightvessels, platforms, and shore stations that are listed on the Data Information sheets.

Ship or Fixed Station -- The name of the ship, lightvessel, platform, lighthouse, shore station, etc. Names of ships and lightvessels are given in capital letters, with lightvessels identified by (LV) after their name. All others not so identified are shore or other types of fixed stations.

Country -- The name of the country that used the ship to collect data, or the name of the country in or near whose territory fixed oceanographic stations observations were made. If the data were collected by an institution of another country, the contributing country is listed after the one where the observations were taken.

Catalogue Number -- The country and institution numbers and ship letter assigned to each ship are given in this column to facilitate locating data information in the catalogue.

EXPLANATION OF THE GEOGRAPHICAL INDEX

The Geographical Index is based on the divisions of areas shown on the three charts immediately preceding the Index. These divisions are defined in "Limits of Oceans and Seas," Special Publication No. 23 of the International Hydrographic Bureau, third edition, Monaco, 1953. To define the extensive areas of the Atlantic, Indian, and Pacific Oceans more specifically, the following subdivisions have been added:

23 - North Atlantic Ocean	57 - North Pacific Ocean
23a - Northeast Atlantic	57a - Northwest Pacific
23b - Northwest Atlantic	57b - Northeast Pacific
32 - South Atlantic Ocean	61 - South Pacific Ocean
32a - Southeast Atlantic	61a - Southwest Pacific
32b - Southwest Atlantic	61b - Southeast Pacific
45 - Indian Ocean	SO - Southern Oceans
45a - Northwest Indian	South of latitude
45b - Northeast Indian	50° South
45c - Southwest Indian	
45d - Southeast Indian	

The catalogue numbers of ship cruises extending into any of the areas, or shore or fixed stations located in the areas, are listed under the area's number and name.

ALPHABETICAL INDEX

SHIP OR FIXED STATION	COUNTRY	CATALOGUE NUMBER
3-101	PEOPLE'S REPUBLIC OF CHINA	173.01 X
3-141	PEOPLE'S REPUBLIC OF CHINA	173.01 Y
3-151	PEOPLE'S REPUBLIC OF CHINA	173.01 Z
- A -		
ACANIA	U.S.A.	139.40 A
ACT 3	UNITED KINGDOM	138.02 K
ACT 4	UNITED KINGDOM	138.02 K
ACT 6	UNITED KINGDOM	138.02 K
ACT 10	GERMANY (Federal Republic)	114.01 R
ADELAIDE	AUSTRALIA	102.06 A
ALBATROSS IV	U.S.A.	139.23 D
ALEJERO HUMBOLDT	PERU	130.01 E
ALFRED NEEDLER	CANADA	106.11 V
ALMEIDA CARVALHO	PORTUGAL	133.01 D
ALPHA HELIX	U.S.A.	139.20 H
ANRO ASIA	SINGAPORE	181.01 A
ANRO AUSTRALIA	AUSTRALIA	102.06 A
AUSTRALIAN	AUSTRALIA	102.06 A
- B -		
BIOS	YUGOSLAVIA	242.02 A
BUCCANEER	ECUADOR	110.03 A
BUNKER HILL	UNITED KINGDOM	138.02 K
- C -		
CANBERRA	AUSTRALIA	102.06 A
CANTERBURY	NEW ZEALAND	127.02 A
CAP ANAMUR	PANAMA	156.01 A
CAPRICORNE	FRANCE	113.03 H
CARILLO	PERU	130.01 G
CAVARA	UNITED KINGDOM	138.02 K
CHANG ZHOU	PEOPLE'S REPUBLIC OF CHINA	173.02 E
CHANGSHENG	PEOPLE'S REPUBLIC OF CHINA	173.01 AA
CHARLES DARWIN	UNITED KINGDOM	138.10 B
CHILOE III	PERU	130.01 F
CHOFU MARU	JAPAN	124.10 D
COLUMBUS CANADA	GERMANY (Federal Republic)	114.01 R
COLUMBUS OREGON	FRANCE	113.03 D
COLUMBUS VICTORIA	FRANCE	113.03 D
COLUMBUS VIRGINIA	FRANCE	113.03 D
COLUMBUS WELLINGTON	FRANCE	113.03 D
COOK	AUSTRALIA	102.06 A
CORIOLIS	FRANCE	113.03 D
		113.07 J
CYROS	FRANCE	113.14 G

ALPHABETICAL INDEX

SHIP OR FIXED STATION	COUNTRY	CATALOGUE NUMBER
- D -		
DAIO	JAPAN	124.13 B
DARWIN	AUSTRALIA	102.06 A
DAVID STARR JORDAN	U.S.A.	139.23 Y
DAWSON	CANADA	106.09 I
DELAWARE II	U.S.A.	139.23 P
DERWENT	AUSTRALIA	102.06 A
DEUTSCHE BUCHT (LV)	GERMANY (Federal Republic)	214.01
DISCOVERY	UNITED KINGDOM	138.05 B
DONG FANG HONG	PEOPLE'S REPUBLIC OF CHINA	173.01 J
- E -		
E. E. PRINCE	CANADA	106.11 J
ELBE 1 (LV)	GERMANY (Federal Republic)	214.01
ELGAREN	SWEDEN	135.01 J
ESAN	JAPAN	124.13 B
ETIZEN	JAPAN	124.13 B
- F -		
FARNELLA	UNITED KINGDOM	138.02 K
FEHMARNBELT (LV)	GERMANY (Federal Republic)	214.01
FERREL	U.S.A.	139.23 R
FRAAY	SOUTH AFRICA	136.01 I
FRANKLIN	AUSTRALIA	102.06 C
- G -		
GAUGIN	FRANCE	113.07 J
GAUSS	GERMNAY (Federal Republic)	114.01 C
GENERAL SAN MARTIN	ARGENTINA	101.01 B
GLACIER	U.S.A.	139.16 M
GONZALEZ ORTEGA	MEXICO	125.04 A
GUILLERMO PRIETO	MEXICO	125.04 A
GUS III	U.S.A.	139.23 BB
- H -		
HAI DIAO 10	PEOPLE'S REPUBLIC OF CHINA	173.01 BB
HAI DIAO 822	PEOPLE'S REPUBLIC OF CHINA	173.01 CC
HAI JIAN 40	PEOPLE'S REPUBLIC OF CHINA	173.01 DD
HAI JIAN 47	PEOPLE'S REPUBLIC OF CHINA	173.01 EE
HAI JIAN 71	PEOPLE'S REPUBLIC OF CHINA	173.01 FF
HAI JIAN 72	PEOPLE'S REPUBLIC OF CHINA	173.01 GG
HAI JIAN 73	PEOPLE'S REPUBLIC OF CHINA	173.01 HH
HIKAWA II	PANAMA	156.01 A
HOBART	AUSTRALIA	102.06 A
HOKUSEI MARU	JAPAN	124.02 C

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SHIP OR FIXED STATION	COUNTRY	CATALOGUE NUMBER
- I -		
ISAZU	JAPAN	124.13 B
ISLA FLOREANA	ECUADOR	110.03 A
IWAKI	JAPAN	124.13 B
- J -		
JEAN CHARCOT	FRANCE	113.14 A
		113.16 A
JEBSEN SOUTHLAND	GERMANY (Federal Republic)	114.01 R
JEBSEN TIMARU	PHILIPPINES	131.02 A
JINXING	PEOPLE'S REPUBLIC OF CHINA	173.02 L
- K -		
KAIYO	JAPAN	124.13 B
KAKADIAMAA	GHANA	116.01 E
KANG GONG I	PEOPLE'S REPUBLIC OF CHINA	173.01 W
KEIFU MARU	JAPAN	124.01 F
Kiel (LH)	GERMANY (Federal Republic)	214.01
KINGFISH	U.S.A.	139.23 AA
KNORR	U.S.A.	139.01 I
KOFU MARU	JAPAN	124.08 D
KOLN ATLANTIC	GERMANY (Federal Republic)	114.01 T
KOSIKI	JAPAN	124.13 B
KOYO MARU	JAPAN	124.16 A
KUDARA	JAPAN	124.13 B
KUYU 401	PEOPLE'S REPUBLIC OF CHINA	173.01 V
- L -		
LA PELAGIA	FRANCE	113.19 A
LE NOROIT	FRANCE	113.18 D
LE SUROIT	FRANCE	113.14 E
LILLOOET	GERMANY (Federal Republic)	114.01 R
LONGHORN	U.S.A.	139.39 A
- M -		
MANCHESTER	UNITED KINGDOM	138.02 K
MANZANILLO	MEXICO	125.04 B
MARION DUFRESNE	FRANCE	113.07 H
MATUSIMA	JAPAN	124.13 B
MCARTHUR	U.S.A.	139.23 W
MEIRING NAUDE	SOUTH AFRICA	136.01 C
MELVILLE	U.S.A.	139.08 Q
MICRONESIAN COMMERCE	PANAMA	156.01 A
MICRONESIAN INDEPENDENCE	PANAMA	156.01 A
MILLER FREEMAN	U.S.A.	139.10 GG
		139.23 X

ALPHABETICAL INDEX

SHIP OR FIXED STATION	COUNTRY	CATALOGUE NUMBER
MOANA PACIFIC	PANAMA	156.01 A
MORESBY	AUSTRALIA	102.06 A
MT. CABRITE	LIBERIA	180.01 A
- N -		
Neah Bay	U.S.A.	239.02
NEDLLOYD BALTIMORE	NETHERLANDS	126.02 B
NEDLLOYD KATWIJK	NETHERLANDS	126.02 B
NEDLLOYD KEMBLA	NETHERLANDS	126.02 B
NEDLLOYD KINGSTON	NETHERLANDS	126.02 B
NEDLLOYD KYOTO	NETHERLANDS	126.02 B
NEW HORIZON	U.S.A.	139.08 V
Nordsee (Platform)	GERMANY (Federal Republic)	214.01
NOTO	JAPAN	124.13 B
- O -		
Ocean Data Buoys	JAPAN	224.01 A
OCEANOGRAPHIC VESSEL NO.1	THAILAND	151.01 A
OCEANUS	U.S.A.	139.01 L
OSHORO MARU	JAPAN	124.02 B
OTAMA	AUSTRALIA	102.06 A
- P -		
PACIFIC ISLANDER	PANAMA	156.01 A
PAC KING	LIBERIA	180.01 A
PAC MONARCH	LIBERIA	180.01 A
PAC PRINCE	LIBERIA	180.01 A
PAC PRINCESS	LIBERIA	180.01 A
PARRAMATTA	AUSTRALIA	102.06 A
POLAR DUKE	U.S.A.	139.32 B
POLARSIRKEL	GERMANY (Federal Republic)	114.12 B
POLYNESIA	LIBERIA	180.01 A
PRESIDENTE IBANEZ	PANAMA	156.01 A
PROFESSOR W. BESNARD	BRAZIL	104.02 B
- R -		
RACINE	FRANCE	113.07 J
RANIER	U.S.A.	139.23 C
RESEARCHER	U.S.A.	139.23 A
RIMBAUD	FRANCE	113.07 J
RINSARD	FRANCE	113.07 J
RODIN	FRANCE	113.07 J
ROSTAND	FRANCE	113.07 J
ROUSSEAU	FRANCE	113.07 J
RYOFU MARU	JAPAN	124.01 B

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SHIP OR FIXED STATION	COUNTRY	CATALOGUE NUMBER
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SEIFU MARU	JAPAN	124.11 D
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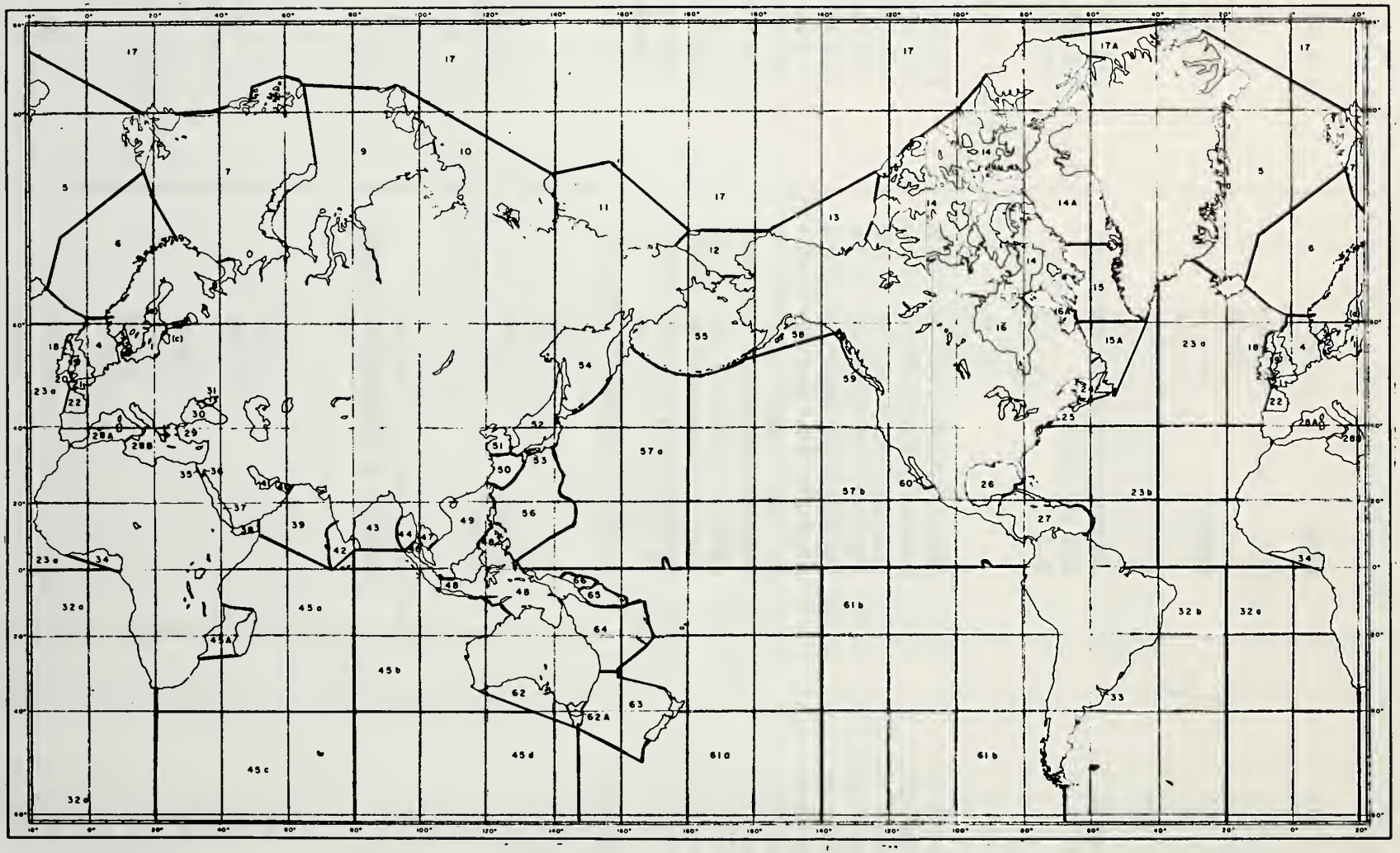
ZEWEN 125	PEOPLE'S REPUBLIC OF CHINA	173.01 R



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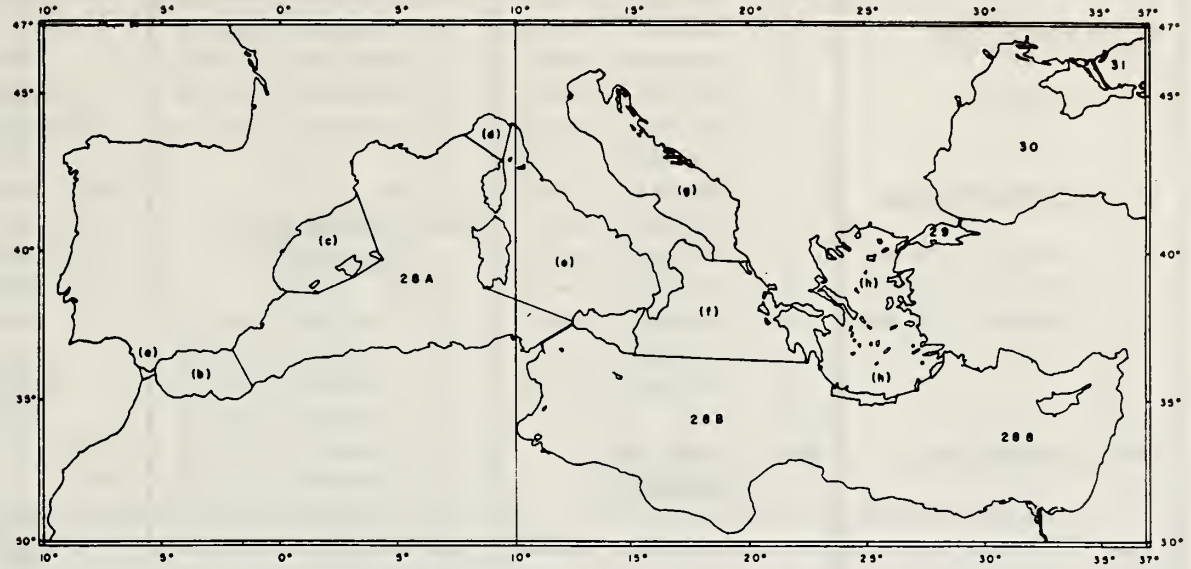
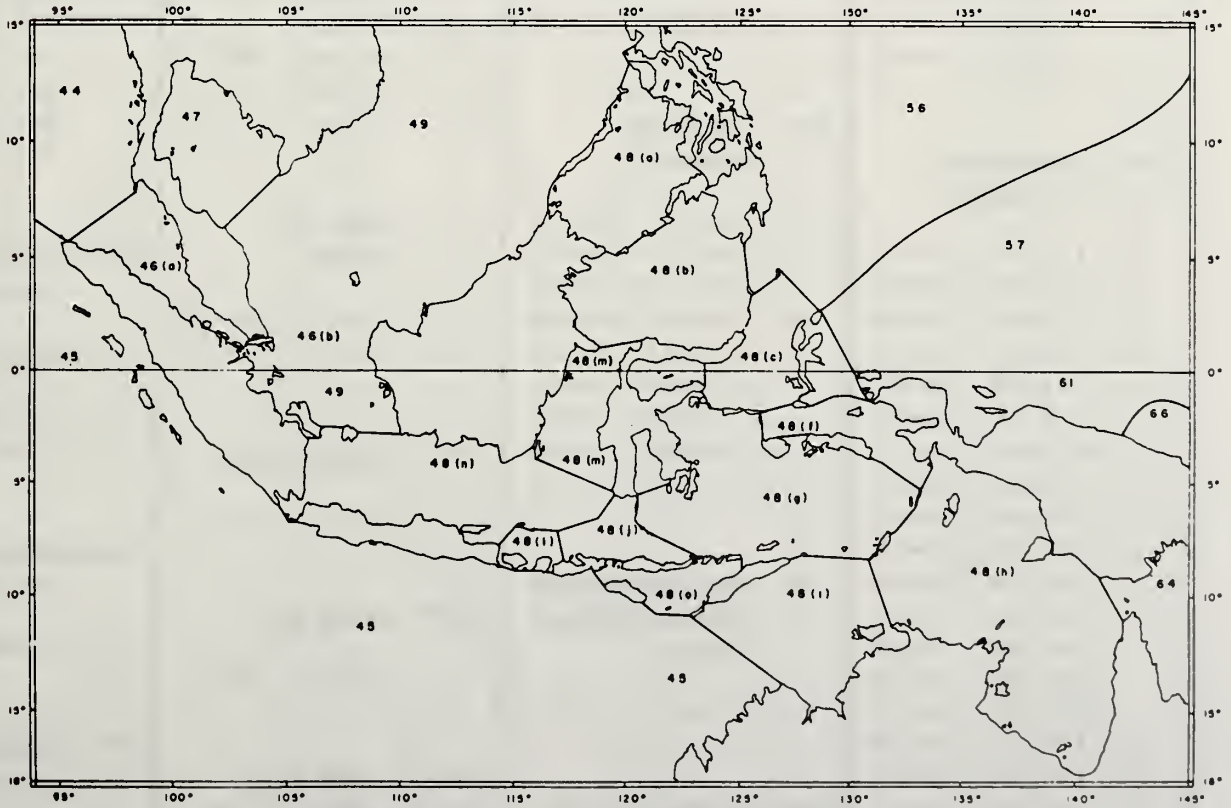


GEOGRAPHICAL INDEX - DETAILS OF MEDITERRANEAN AREA



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13. FRANCE
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53. VENEZUELA
54. EL SALVADOR
55. COSTA RICA
56. PANAMA
57. HONDURAS
58. DOMINICAN REPUBLIC
59. HAITI
60. CUBA
61. JAMAICA
62. AUSTRIA
63. ROMANIA
64. ARAB REPUBLIC OF EGYPT
65. LEBANON
66. ALGERIA
67. MONACO
68. GREECE
69. TANZANIA
70. SIERRA LEONE
71. TUNISIA
72. TRINIDAD AND TOBAGO
73. PEOPLE'S REPUBLIC OF CHINA
74. CZECHOSLOVAKIA
75. MAURITANIA
76. BULGARIA
77. BENIN
78. PEOPLE'S DEMOCRATIC REPUBLIC OF YEMEN
79. IRAQ
80. LIBERIA
81. SINGAPORE

LIST OF INITIALS OF DATA CENTERS

AODC	Australian Oceanographic Data Centre
BNDO	Bureau National des Donnees Oceaniques, France
CEADO	Centro Argentino de Datos Oceanograficos
CECOLDO	Centro Colombiano de Datos Oceanograficos
CEDO	Centro Espanol de Datos Oceanograficos
CENADO	Centro Nacional de Datos Oceanograficos, Mexico
CENDOC	Centro Nacional de Datos Oceanograficos de Chile
CNODC	China National Oceanographic Data Center
CNRDO	Centro Nazionale Raccolta Dati Oceanografici, Italy
DOD	Deutsches Ozeanographisches Datenzentrum
ENODC	Egyptian National Oceanographic Data Center
FAOFDC	Food and Agriculture Organization of the United Nations, Fishery Data Centre
ICES	International Council for the Exploration of the Sea
IHO	International Hydrographic Organization
INODC	Indian National Oceanographic Data Center
JODC	Japan Oceanographic Data Center
KODC	Korean Oceanographic Data Center
MEDS	Marine Environmental Data Service, Canada
MIAS	Marine Information and Advisory Service, United Kingdom
NCOG	Nederlands Centrum voor Oceanografische Gegevens
NOD	Norsk Oseanografisk Datasenter
NODC	National Oceanographic Data Center, U.S.A.
PSMSL	Permanent Service for Mean Sea Level
SADCO	South African Data Centre for Oceanography

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COUNTRY	INSTITUTION	CATALOGUE NUMBER	
01 ARGENTINA	Servicio de Hidrografia Naval.....	101.01	
02 AUSTRALIA	Royal Australian Navy.....	102.06	
04 BRAZIL	Universidade de Sao Paulo, Instituto Oceanografico.....	104.02	
06 CANADA	Bedford Institute of Oceanography.....	106.09	
	Fisheries Research Board of Canada, Biological Station, St. Andrews, N.B.....	106.11	
	University of British Columbia, Institute of Oceanography.....	106.19	
10 ECUADOR	Instituto Oceanografico de la Armada...	110.03	
13 FRANCE	Office de la Recherche Scientifique et Technique Outre-Mer.....	113.03	
	Museum National d'Histoire Naturelle...	113.07	
	Institut Scientifique et Technique des Peches Maritimes.....	113.09	
	Centre National pour l'Exploitation des Oceans (CNEXO).....	113.14	
	Laboratoire Arago, Banguls-sur-Mer.....	113.16	
	Institut Francais de Recherche pour l'Exploitation de la Mer (IFREMER)...	113.18	
	Institut Scientifique et Technique des Peches Maritimes.....	113.19	
14 GERMANY (Federal Republic)	Deutsches Hydrographisches Institut....	114.01	214.01
	Bundesforschungsanstalt fur Fischerei..	114.05	
	Alfred-Wegener-Institut fur Polar-und Meeresforschung.....	114.12	
16 GHANA	Fishery Research Unit.....	116.01	
24 JAPAN	Japan Meteorological Agency.....	124.01	224.01
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	Maizuru Marine Observatory.....	124.11	
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	Tokai University.....	124.25	
	National Institute of Polar Research...	124.31	
25 MEXICO	Mexican Navy.....	125.04	
26 NETHERLANDS	Royal Netherlands Navy.....	126.02	
27 NEW ZEALAND	New Zealand Oceanographic Institute....	127.01	
	New Zealand Royal Navy.....	127.02	
28 NORWAY	Institute of Marine Research.....	128.01	
30 PERU	Instituto del Mar del Peru.....	130.01	
31 PHILIPPINES	Philippine Navy.....	131.02	
33 PORTUGAL	Instituto Hidrografico, Servicio de Oceanografia.....	133.01	
35 SWEDEN	Institute of Hydrographic Research.....	135.01	
36 SOUTH AFRICA	Division of Sea Fisheries, Oceanographic Research Institute.....	136.01	
37 UNION OF SOVIET SOCIALIST REPUBLICS	Pacific Ocean Institute of Scientific Marine Fisheries and Oceanography (TINRO).....	137.13	
38 UNITED KINGDOM	Hydrographic Department, Admiralty.....	138.02	
	National Institute of Oceanography.....	138.05	
	Natural Environment Research Council...	138.10	
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	U.S. Naval Oceanographic Office.....	139.03	
	University of Washington.....	139.04	
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	National Science Foundation.....	139.32
	University of Texas.....	139.39
	U.S. Naval Postgraduate School.....	139.40
42 YUGOSLAVIA	Institute of Oceanography and Fisheries.....	242.02
51 THAILAND	Hydrographic Department, Royal Thai Navy.....	151.01
56 PANAMA	Ships of Opportunity Program.....	156.01
73 PEOPLE'S REPUBLIC OF CHINA	National Bureau of Oceanography.....	173.01
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80 LIBERIA	Ships of Opportunity Program.....	180.01
81 SINGAPORE	Ships of Opportunity Program.....	181.01

PART II

CATALOGUE

EXPLANATION OF WDC-A, OCEANOGRAPHY, DATA INFORMATION SHEET

The Change Notice lists on Data Information sheets the data which have been received by this Center. The entries are described below. Countries are arranged in the sequence shown in the numerical list of countries. Data from each country are arranged in the sequence of catalogue numbers. The 200-series data sheets follow the last 100-series data sheet in the catalogue.

Country/Catalogue Number -- The series number and two digit number of the contributing country, as well as the identifying number for the data information, are given in this column. Details of the catalogue numbering system are given in the section How to Use the Change Notice to the Catalogue of Data. The numbers corresponding to the country and institution portions of the Catalogue Number are found in the index section that lists countries and contributing institutions.

Country/Ship or Fixed Station -- The country name, as well as the names of ships are printed in capital letters; lightvessels are identified by (LV) following the name. All other names not so designated are those of shore stations and other types of fixed platforms, such as lighthouses (LH) or offshore towers; names are reported as they appear with the data.

Start Date/End Date -- The dates during which the data were gathered are given in the order of day/month/year. In some instances, depending on the nature of the project, the dates indicate the beginning and ending of a cruise or expedition, while in others the dates indicate the first and last observations. For shore and fixed stations months and years only are usually given.

Region -- The region(s) of the World Ocean where observations were gathered. The areas listed are defined in "Limits of Oceans and Seas," International Hydrographic Bureau, Special Publication No. 23, third edition, Monaco, 1953, with certain modifications as indicated in the Catalogue Indexes section.

Oceanographic Serial Stations

Number of Stations -- The number of oceanographic serial stations (also referred to as hydrographic, hydrographical, hydrological and hydrochemical stations by various authorities) at which serial measurements of temperature, salinity, and other chemical values are made, normally to depths of five meters or greater. Data to depths less than five meters are usually catalogued as Surface Observations. The single dagger symbol (†) is used to denote data obtained by electronic, in-situ, Salinity/Temperature/Depth (STD) or Conductivity/Temperature/Depth (CTD) sensors.

Physical and Chemical Data -- The types of physical and chemical data, available at serial depths as observed and as computed values, are listed using the following symbols and abbreviations:

T -	Temperature of the water sample
Cl -	Chlorinity
S -	Salinity
O2 -	Dissolved oxygen content
CO_2 -	Carbon dioxide
pH -	Hydrogen ion concentration
Alk -	Alkalinity
N -	Nitrogen compounds
P -	Phosphorous compounds
Si -	Silicon compounds
sig-t -	Density of the water at T & S in-situ and at atmospheric pressure
SVA -	Anomaly of specific volume
TherAnom -	Thermosteric anomaly
ΔD -	Anomaly of dynamic heights
PE -	Potential energy
PT -	Potential temperature
Q -	Q factor for transport computations
Vs -	Speed of sound

NOTE: Chemical compounds may also be indicated by standard chemical symbols.

Sample Depths -- The depth, or range of depths, to which the predominant number of samples/casts for that particular cruise were observed. They are recorded to the nearest 100 meters, except when the observations are in water less than 100 meters in depth, in which case they are usually recorded to the nearest 10 meters.

Maximum Depth -- The actual depth of the deepest sample/cast for a particular cruise or data set and is not rounded off.

BT's -- The type and number of mechanical bathythermograph (MBT) or expendable bathythermograph (XBT) observations are indicated by:

MB -	Analog prints of bathythermographs taken by a mechanical BT
MTb -	Tables or listings of mechanical BT temperature readings at selected depths
XB -	Analog prints of bathythermographs taken by an expendable BT
XTb -	Tables or listings of expendable BT temperature readings at selected depths

DTb - Table or listings of digital BT temperature readings at selected depths

Currents -- The types and quantity of observations of surface and subsurface currents are indicated by:

Surf - Surface
Subs - Subsurface

Biological -- The types of marine biological observations made and the number of stations and/or abundance of data are indicated by any of the following categories:

Phyt - Phytoplankton
Pigm - Pigments
PrPr - Primary productivity
Zoo - Zooplankton
Nek - Nekton
Eggs - Fish eggs and/or larvae
Neus - Neuston
Pleu - Pleuston
Sest - Seston
Bent - Benthos
PeF - Pelagic fishes
DeF - Demersal fishes
Cet - Cetacea
Micr - Microbiological data
Biol - Bioluminescence
Poll - Pollution studies
Surf - Surface visual observations of birds, fishes mammals, reptiles and discolored water
FObs - Fishery observations
C14 - Carbon
Bore - Borers and foulers

Meteorological -- The types of meteorological observations taken in conjunction with oceanographic data are indicated by:

Wd - Wind direction and speed
W - Weather
Ta - Temperature of the air, dry bulb
Tw - Temperature of the air, wet bulb
Bar - Atmospheric pressure, barometer
Cld - Clouds
Vis - Visibility
Hum - Humidity
DP - Dew point
Pre - Precipitation
SoRa - Solar radiation
Rad - Radiosonde observations

Sea Surface -- The types of sea surface observations and measurements taken are listed. In addition to the abbreviations and symbols listed for Physical and Chemical Data, the following

are also used:

Col - Color of the water
Tra - Transparency of the water
Wa - Visual data on waves, including sea state
IWa - Instrumented wave data
Ice - Data on ice in the sea
LP - Light penetration
LPW - Long period wave records

Data Center Reference Number -- Data which have been processed by Automatic Data Processing (ADP) machine methods at a national, regional, or responsible oceanographic data center, usually have been assigned some type of identifying reference number by that center. The availability of data in magnetic tape or machine listing format is indicated by the initials of the data center followed by that center's reference number. For example, machine-processed oceanographic station data for Reference Number 310863 of the National Oceanographic Data Center would appear as NODC 310863. As a means of identifying those types of data that have been machine-processed and thus correspond to the Reference Number, the Diamond symbol (◊) is entered in the appropriate columns describing data that are automated under that Reference Number.

Publication number refers to the Catalogue Number from the WDC-A, Oceanography Catalogue of Accessioned Publications Supplement identifying the published report in which the referenced data appear. The absence of a number in this column indicates that the data were not received in published form.

Remarks -- Any additional information included to further describe the data. The term "(CAT. OF DATA)" or "(Change)", indicates that data for this listed cruise represent an addition to data previously received by WDC-A, Oceanography, and already described under this Catalogue Number in the Catalogue of Data (including Change Notice Nos. 1-16) or the referenced Change Notice. An asterisk (*) is placed beside each data entry which represents an addition to data catalogued previously; the total number of observations held for this cruise is shown in parentheses ( ) beneath the data entry. Data entries preceded by a minus sign (-) and enclosed in parentheses, e.g. (-9), indicate a deletion of observations. For more extensive explanation of some cruises, the Remarks Section immediately follows the main Catalogue Section in this Change Notice.

NOTE: Track charts showing locations of oceanographic observations are not printed in the Change Notice. If a track chart is available for a particular cruise, that information will be given in the Remarks Section of this Change Notice. WDC-A will gladly provide copies of such track charts upon request.

WDC-A, OCEANOGRAPHY DATA INFORMATION

COUNTRY/ CATALOGUE NUMBER	COUNTRY/ SHIP OR FIXED STATION	START DATE	END DATE	IHB REG.	TYPES OF OBSERVATIONS: OCEANOGRAPHIC SERIAL STATIONS NO. OF STAS.	PHYS. & CHEM. DATA	SAMPLE DEPTHS	MAX. DEPTH	BATHY-THERMO-GRAPH	CURRENTS	BIO-LOGICAL	METEORO-LOGICAL	SEA SURFACE	DATA CENTER REFERENCE NUMBER	REMARKS
101.....	ARGENTINA.....														
101.01 B-17	GENERAL SAN MARTIN	16/10/78	02/11/78												Delete station data - duplicate data (Change 28)
101.01 B-18	GENERAL SAN MARTIN														Number deleted from catalogue - duplicate data (Change 29)
102.....	AUSTRALIA.....														
102.06 A-26	ADELAIDE, ANRO AUSTRALIA, AUSTRALIAN, CANBERRA, COOK, DARWIN, DERWENT, HOBART, MORESBY, OTAMA, PARRAMATTA, TORRENS	01/01/87	31/12/87	45b 48 56 57a 61a 64 65 66					XTb- 1,216 ◊					NODC TOGA PACIFIC DATA BASE	
102.06 A-27	ANRO AUSTRALIA, AUSTRALIAN, CANBERRA, COOK, DARWIN, DERWENT, HOBART, PARRAMATTA, STUART, SWAN, TORRENS	01/01/88	31/12/88	45b 48 49 56 57a 57b 61a 64 65 66					XTb- 1,355 ◊					NODC TOGA PACIFIC DATA BASE	
102.06 B-01	SPRIGHTLY	08/07/82	18/07/82	62 63	29 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-500	991						NODC 099018	
102.06 B-02	SPRIGHTLY	04/05/83	21/12/83	62 63 64	409 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	5-1485	1485						NODC 099019 thru 099024, 099030	
102.06 B-03	SPRIGHTLY	09/01/84	14/11/84	62 63	438 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	15-1485	1486						NODC 099025 thru 099029, 099031 thru 099033	
102.06 C-01	FRANKLIN	19/06/85	17/12/85	57a 61a 64 65 66	321 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-4500	5475						NODC 099001 thru 099004	
102.06 C-02	FRANKLIN	08/01/86	19/11/86	57a 61a 63 64 65 66 SO	258 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-3900	3940						NODC 099005 thru 099008	

* DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC-A, OCEANOGRAPHY.
† DENOTES DATA OBTAINED BY ELECTRONIC, IN-SITU, CONDUCTIVITY/SALINITY/TEMPERATURE/DEPTH (CTD/STD) SENSORS.
◊ INDICATES MACHINE PROCESSED DATA THAT CORRESPONDS TO THE DATA CENTER REFERENCE NUMBER.
†† FOR ADDITIONAL DESCRIPTIVE REMARKS PLEASE SEE THE REMARKS SECTION.

WDC-A, OCEANOGRAPHY DATA INFORMATION

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102.06 C-03	FRANKLIN	20/01/87	20/11/87	45b 48h 481 62	484 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-4900	5475						NODC 099009 thru 099013	
102.06 C-04	FRANKLIN	21/02/88	16/12/88	45b 48h 57a 61a 64 65 66	282 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-2800	4134						NODC 099014 thru 099017	
104.....	BRAZIL.....														
104.02 B-10	PROFESSOR W. BESNARD	02/08/72	22/08/72	32b	26	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	15-200	1500						NODC 141038	
104.02 B-11	PROFESSOR W. BESNARD	11/08/73	17/08/73	32b	15	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	20-700	1680						NODC 141039	
104.02 B-12	PROFESSOR W. BESNARD	13/09/77	15/09/77	32b	26	(T, S, sig-t, SVA, ΔD, Vs) ◊	18-40	40						NODC 141040	
104.02 B-13	PROFESSOR W. BESNARD	16/01/81	23/01/81	32b	46	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-135	200						NODC 141041	
106.....	CANADA.....														
106.09 I-44	DAWSON	31/07/75	04/08/75	24	496 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	15-45	45						NODC 188313	Cruise 19
106.09 I-45	DAWSON	23/05/84	28/05/84	23b	33 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	32-235	243						NODC 188372	Cruise 8
106.09 I-46	DAWSON	23/04/85	13/12/85	25	78	(T, S, sig-t, SVA, ΔD, Vs) ◊	5-33	34						NODC 188380, 188381	Cruises 900 & 950
106.11 J-27	E. E. PRINCE	28/02/84	13/03/84	23b	138	(T, S, sig-t, SVA, ΔD, Vs) ◊	25-200	209						NODC 188335	Cruise 1
106.11 V-09	ALFRED NEEDLER	07/07/86	30/07/86	23b	175	(T, S, sig-t, SVA, ΔD, Vs) ◊	40-300	335						NODC 188336, 188337	Cruises 3 & 4
106.19 A-09	VECTOR	02/01/90	13/12/90	59	128	T, S, sig-t, O2	50-550	650				Wd, Ta, Tw, Cld, Bar		Publication 06.08-014	Cruises 90/01 thru 90/05, 90/07, 90/12, 90/13

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WDC-A, OCEANOGRAPHY DATA INFORMATION

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110.....	ECUADOR.....														
110.03 A-03	BUCCANEER, ISLA FLOREANA	27/01/87	23/11/87	57a 57b 61b					XTb-37 ◊					NODC TOGA PACIFIC DATA BASE NODC (BT) ††	
110.03 A-04	BUCCANEER, ISLA FLOREANA	10/02/88	25/10/88	57a 57b 61b					XTb-41 ◊					NODC TOGA PACIFIC DATA BASE	
113.....	FRANCE.....														
113.03 D-28	CORIOLIS	08/01/77	18/02/77	61a	74	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO4, pH) ◊	900-1170	1174						NODC 358439	
113.03 D-29	CORIOLIS	01/10/79	09/11/79	45a	56	(T, S, sig-t, SVA, ΔD, Vs, PO4, SiO4) ◊	20-200	200						NODC 358420	
113.03 D-30	CORIOLIS	22/02/79	27/03/79	61a	231	(T, S, sig-t, SVA, ΔD, Vs, O2, SiO4) ◊	50-1090	5000						NODC 358351	Cruise HYDROTHON 02
113.03 D-31	CORIOLIS	01/02/78	30/03/78	61a 61b 64	73	(T, S, sig-t, SVA, ΔD, Vs, O2, SiO4) ◊	100-1170	1179						NODC 358348	Cruise 78-01
113.03 D-32	CORIOLIS	03/02/84	22/05/84	64	271 †	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2) ◊	200-250	400						NODC 358369, 358370	Cruises PREFIL 8 & PREFIL 9
113.03 D-33	CORIOLIS	17/06/86	05/07/86	57a 61a 64	70 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	200-1000	1000						NODC 358377	Cruise SURTROPAC 6
113.03 D-34	CORIOLIS	21/08/76	29/09/76	57a 61a	93	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, Ptotal, NO2, SiO4, pH) ◊	272-300	300						NODC 358346	Cruise EPONITE 2
113.03 D-35	CORIOLIS	09/05/82	14/05/82	61a	133	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2) ◊	116-200	1000						NODC 358362	Cruise PREFIL II
113.03 D-36	CORIOLIS	10/01/84	15/08/84	57a 61a 64	96 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	160,1000	1000						NODC 358368, 358371	Cruises SURTROPAC 8401 & 8402 Period: 10-20/1/84 and 5-15/8/84

* DATA FOR THIS CRUISE REPRESENT AN ADDITION TO DATA PREVIOUSLY RECEIVED BY WDC-A, OCEANOGRAPHY.
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WDC-A, OCEANOGRAPHY DATA INFORMATION

COUNTRY/ CATALOGUE NUMBER	COUNTRY/ SHIP OR FIXED STATION	START DATE	END DATE	IHB REG.	TYPES OF OBSERVATIONS: OCEANOGRAPHIC SERIAL STATIONS NO. OF STAS.	PHYS. & CHEM. DATA	SAMPLE DEPTHS	MAX. DEPTH	BATHY-THERMO-GRAPH	CURRENTS	BIO-LOGICAL	METEORO-LOGICAL	SEA SURFACE	DATA CENTER REFERENCE NUMBER	REMARKS
113.03 D-37	CORIOLIS	09/01/85	21/01/85	57a 61a 64	70 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	1000	1000						NODC 358374	Cruise SURTROPAC 8501
113.03 D-38	CORIOLIS	10/01/86	26/01/86	57a 61a 64	76 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	1000	1016						NODC 358376	Cruise SURTROPAC 5
113.03 D-39	CORIOLIS	28/06/83	09/07/83	57a 61a 64	62 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	253-1000	1000						NODC 358375	Cruise CORINDON IX
113.03 D-40	CORIOLIS	02/06/81	11/06/81	64	21	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2) ◊	295-1196	1196						NODC 358356	Cruise HYDROTHON 05
113.03 H-16	CAPRICORNE	17/11/78	04/12/78	23a	38	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-150	150					(T, S, sig-t, SVA, ΔD, Vs)-8 ◊	NODC 358419	Cruise GUINEE
113.03 H-17	CAPRICORNE	04/02/80	23/02/80	23a	67	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-200	203						NODC 358422	Cruise ECHOSAR I
113.03 H-18	CAPRICORNE	10/03/74	28/03/74	23a	53	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4) ◊	20-40	70						NODC 358428	
113.07 H-10	MARION DUFRESNE	01/03/77	28/03/77	45a 45c SO	29	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	570-4500	4586						NODC 358433	
113.07 H-11	MARION DUFRESNE	25/05/83	11/06/83	23a	36 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	2460-4830	4924						NODC 358402	Cruise FOCAL MD36
113.07 H-12	MARION DUFRESNE	24/02/85	27/03/85	45a 45c SO	68 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	595-5100	5198						NODC 358403	Cruise INDIGO 01, MD43
113.07 J-03	CORIOLIS, GAUGIN, RODIN, ROSTAND, ROUSSEAU	01/01/87	31/12/87	57a 57b 61a 61b 64					XTb-1,060 ◊					NODC TOGA PACIFIC DATA BASE	
113.07 J-04	CORIOLIS, RACINE, RIMBAUD, RODIN, RONSARD, ROSTAND, ROUSSEAU	01/01/88	31/12/88	57b 61a 61b 64					XTb-469 ◊					NODC TOGA PACIFIC DATA BASE	
113.09 B-03	THALASSA	29/07/73	18/08/73	23a	98	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	17-200	200						NODC 358426	

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113.14 A-09	JEAN CHARCOT	01/09/79	15/10/79	23a	75 † * (128)									NODC 358387 *	Cruise 12, Legs 1 & 2, TOURBILLON II, MAPCO (Change 47) 128 CTD stations
113.14 A-10	JEAN CHARCOT	30/08/81	16/09/81	23a	61	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO4) ◊	45-1500	1504						NODC 358410	Cruise RCA-1
113.14 A-11	JEAN CHARCOT	09/09/80	30/09/80	23a	29 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	3990-4930	5008						NODC 358390	Cruise SEABED II
113.14 E-02	LE SUROIT	24/06/83	05/09/83	23a 23b	230 * (358) †									NODC 358399, 358400 *	Cruises BIOCYAN 2, TOPOGULF 2 & 3 128 CTD stations (Change 47)
113.14 E-03	LE SUROIT	03/08/78	11/09/78	34	137 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	143-496	496						NODC 358383	Cruise CIPREA
113.14 G-01	CYROS	03/06/80	13/06/80	22 23a	191 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-116	117						NODC 358388	Cruise DYNATLANT
113.16 A-02	JEAN CHARCOT	13/03/74	18/04/74	23a	115	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4) ◊	10-21	21						NODC 358427	Cruise CINECA V
113.18 D-01	LE NOROIT	27/08/82	22/09/82	23b	121 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	25-112	112						NODC 358393	Cruise SATIR - DYNATLANT 2
113.18 D-02	LE NOROIT	18/02/82	04/03/82	28A	106 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	248-2500	2691						NODC 358395	Cruise DYOME II
113.18 D-03	LE NOROIT	24/02/83	21/03/83	22	70 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-250	1685						NODC 358401	Cruise TRANSEPLAT
113.19 A-01	LA PELAGIA	10/09/82	15/09/82	22	29	(T, S, sig-t, SVA, ΔD, Vs) ◊	65-110	110						NODC 358394	Cruise SATIR - DYNATLANT 2
114.....	GERMANY (Federal Republic).....														
114.01 C-11	GAUSS	27/07/59	19/09/59	14A										Publication 14.02-217 *	Cruise EGIG *

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114.01 R-05	COLUMBUS CANADA, COLUMBUS OREGON, COLUMBUS VICTORIA, COLUMBUS VIRGINIA, COLUMBUS WELLINGTON, JEBSEN SOUTHLAND, LILLOOET, SAXON STAR	01/01/87	31/12/87	56 57a 57b 61a 61b 64 65					XTb-1,707 ◊					NODC TOGA PACIFIC DATA BASE	Ship: AVON renamed COLUMBUS CANADA
114.01 R-06	ACT 10, COLUMBUS CANADA, COLUMBUS OREGON, COLUMBUS VICTORIA, COLUMBUS VIRGINIA, COLUMBUS WELLINGTON, LILLOOET, SAXON STAR	01/01/88	31/12/88	57b 61a					XTb-977 ◊					NODC TOGA PACIFIC DATA BASE	
114.01 T-02	KOLN ATLANTIC	12/01/89	06/12/89	23a 23b					XTb-612					Publication 14.02-219	Ship of Opportunity Programme
114.05 A-18	WALTHER HERWIG	26/11/89	29/11/89	23a 23b					XTb-26					Publication 14.02-219	Cruise 101
114.12 B-01	POLARSIRKEL	04/01/81	26/02/81	32a 32b SO							Zoo-46			Publication 14.06-052	
116.....	GHANA.....														
116.01 E-11	KAKADIAMAA	31/01/89	28/12/89	34	112	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	30-100	100						NODC GH1001	Cruises 1 thru 28
124.....	JAPAN.....														
124.01 B-87	RYOFU MARU	20/01/89	09/12/89	56 57a	130	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, pH, Heavy Metal Hydrocarbon	1250-4500	5004	MTb-88	Surf-GEK -217 Subs-5	Phyt-39 Zoo-39 Pigm-39		S Col, Tra	Publication 24.07-083	Cruise IGOSS, WESTPAC, MARPOLMON Period: 20/1-11/3/89 and 13/9-9/12/89
124.01 B-88	RYOFU MARU	20/04/89	05/11/89	50 51 56 57a	179	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, pH, Heavy Metal Hydrocarbon	30-4000	5018	MTb-74	Surf-GEK -221	Phyt-66 Zoo-82 Pigm-83		S Col, Tra	Publication 24.07-083	Cruise KER, WESTPAC, MARPOLMON Period: 20/4-26/7/89 and 4/10-5/11/89
124.01 F-30	KEIFU MARU	20/01/89	24/11/89	50 52 56 57a	40	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3	400-1000	1023	MTb-162	Surf-GEK -190				Publication 24.07-083	

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124.02 B-61	OSHORO MARU	05/11/89	02/09/90	12 45b 50 51 52 55 57a 57b 58	199 †	T, S, sig-t, TherAnom, SVA, ΔD, O2, PO4, NO2, NO3, Si	30-3000	3000			Phyt-122 Eggs-29 FObs-64	Wd, W, Ta, Tw, Bar	T Wa, Col, Tra	Publication 24.04-045	Cruises 31 thru 34
124.02 C-14	HOKUSEI MARU	15/01/90	26/10/90	52 57a 57b	125 †	T, S, sig-t, SVA, TherAnom, ΔD, O2	100-1500	1500	XTb-11		FObs-67	Wd, W, Ta, Tw, Bar	S Wa, Col, Tra	Publication 24.04-045	Cruises 45 thru 48
124.08 D-78	KOFU MARU	07/02/89	07/03/89	57a	57	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, pH, Heavy Metal Hydrocarbon	600-4040	4047	MTb-40	Surf-GEK -90	Phyt-9 Zoo-19 Pigm-20		S Col,Tra	Publication 24.07-083	Cruise IGOSS, WESTPAC, MARPOLMON
124.08 D-79	KOFU MARU	19/04/89	03/12/89	52 54 57a	311	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, pH, Heavy Metal Hydrocarbon	30-4000	4026	MTb-86	Surf-GEK -355	Phyt-37 Zoo-53 Pigm-71		S Col, Tra	Publication 24.07-083	Cruise KER, IGOSS, WESTPAC, MARPOLMON
124.09 A-94	SHUMPU MARU	07/02/89	22/11/89	52 53 56	71	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, pH, Heavy Metal Hydrocarbon	10-1000	1221	MTb-211	Surf-GEK -246	Phyt-18 Zoo-18 Pigm-36		S Col, Tra	Publication 24.07-083	Cruise IGOSS, WESTPAC, MARPOLMON
124.09 A-95	SHUMPU MARU	20/04/89	02/08/89	53 56	70	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, pH, Heavy Metal Hydrocarbon	10-1000	3000	MTb-125	Surf-GEK -176	Phyt-19 Zoo-20 Pigm-38		S Col, Tra	Publication 24.07-083	Cruise KER, IGOSS, WESTPAC, MARPOLMON
124.10 D-82	CHOFU MARU	20/01/89	21/08/89	50 56	231	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, pH, Heavy Metal Hydrocarbon	30-5000	5467	MTb-41	Surf-GEK -250	Phyt-18 Zoo-18 Pigm-11		T, S Col, Tra	Publication 24.07-083	Cruis IGOSS, WESTPAC, MARPOLMON
124.10 D-83	CHOFU MARU	18/04/89	11/12/89	50 51 52 56	289	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, Heavy Metal Hydrocarbon	30-4500	4500	MTb-72	Surf-GEK -345	Phyt-18 Zoo-18 Pigm-67		T, S Col, Tra	Publication 24.07-083	Cruise KER, IGOSS, WESTPAC, MARPOLMON

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124.11 D-69	SEIFU MARU	04/02/89	22/11/89	52	74	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, Si, pH, Heavy Metal, Hydrocarbon	50-1500	2110	MTb-7	Surf-GEK -153	Phyt-9 Zoo-9 Pigm-27		T, S Col, Tra	Publication 24.07-083	Cruise IGOSS, WESTPAC, MARPOLMON
124.11 D-70	SEIFU MARU	09/05/89	27/10/89	52	287	T, S, TherAnom, ΔD, O2, PO4, NO2, NO3, Si, pH, Heavy Metal, Hydrocarbon	50-1500	1785	MTb-44	Surf-GEK -333	Phyt-27 Zoo-27 Pigm-83		T, S Col, Tra	Publication 24.07-083	Cruise KER, IGOSS, WESTPAC, MARPOLMON
124.13 B-25	KAIYO, DAIO, ESAN, ETIZEN, ISAZU, IWAKI, KOSIKI, KUDARA, MATUSIMA, NOTO, SATUMA, SORATI, SOYA, TYOKAI, YAHIKO	08/01/88	09/12/88	50 52 54 56 57a					XTb-973	Surf-GEK -1,105		Ta	Wa	Publication 24.10-052	
124.13 E-69	TAKUYO	07/02/89	14/03/89	50 56 57a 61a	73 †	T, S, sig-t, SVA, TherAnom, ΔD, Vs, O2, P, Si, pH, Heavy Metal	80-4500	4500	XTb-171	Surf- 1,311 ††		Wd, W, Ta, Tw, Cld, Bar, Vis	Wa	Publication 24.10-051	Cruise 6, WESTPAC
124.13 GGG-20	SHOYO	05/03/88	26/11/88	50 56 57a	215 †	T, S, sig-t, SVA, TherAnom, ΔD, Vs	20-4250	4500	XTb-379			Wd, W, Ta, Tw, Cld, Bar, Vis	Wa	Publication 24.10-052	
124.16 A-32	KOYO MARU	10/12/90	07/03/91	56 57a 57b 61a	106 †	T, S	75-1000	1000	XTb-43		FObs-7	Wd, W, Ta, Bar	T Wa, Col, Tra	Publication 24.11-048	Period: 10-28/12/90 and 13/2-7/3/91
124.16 B-12	TENYO MARU	14/05/90	19/11/90	39 56	45 †	T, S	50-1000	1000			FObs-6	Wd, W, Ta, Bar	T Wa, Col, Tra	Publication 24.11-048	Period: 14-19/5/90 and 16-19/11/90
124.25 A-03	TOKAI UNIVERSITY II	24/01/71	17/02/71	57a	32	T ◊	100-260	265				(Wd, W, Cld) ◊		NODC 498316	
124.31 A-01	Shore-Based Party	22/01/82	28/01/83	45c SO							Zoo-272 * (431)			Publication 24.22-033 *	Cruise JARE-23, BIOMASS (Change 47)
124.31 B-06	SHIRASE	14/11/88	17/03/89	32a 45b 45c 45d 56 61a 63 SO	11 †	T, S, sig-t, ΔD, O2, PO4, NO2, NO3, NH4, SiO3, pH	450-2600	3430	XTb-118			Wd, W, Ta, Tw, Bar, Vis, Hum	T, S, O2, PO4, NO2, NO3, NH4, SiO3, pH Wa	Publication 24.22-032	6 CTD stations

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125.....	MEXICO.....														
125.04 A-01	GONZALEZ ORTEGA, GUILLERMO PRIETO, Ship not identified	18/01/87	21/09/87	57b					XTb-70 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) ††	
125.04 B-01	MANZANILLO	17/03/88	16/08/88	57b					XTb-39 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) ††	Cruise TOGA
126.....	NETHERLANDS.....														
126.02 B-03	NEDLLOYD KATWIJK, NEDLLOYD KEMBLA, NEDLLOYD KINGSTON, NEDLLOYD KYOTO	01/01/87	31/12/87	32a 32b 45a 45b 57b 61a 61b 62 63 64					XTb-742 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) ††	
126.02 B-04	NEDLLOYD BALTIMORE, NEDLLOYD KATWIJK, NEDLLOYD KEMBLA, NEDLLOYD KINGSTON, NEDLLOYD KYOTO	01/01/88	31/12/88	32a 32b 45a 45b 57b 61a 61b 62 63					XTb-614 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) ††	
127.....	NEW ZEALAND.....														
127.01 D-04	TUI	04/07/62	19/08/62	61a	19	(T, S, sig-t, Vs) ◊	300-3000	3900						NODC 610011, 610012, 610013	Cruises T38, T39, T40
127.01 D-05	TUI	24/08/63	26/10/63	61a	30	(T, S, sig-t, SVA, ΔD, Vs) ◊	500-3000	3090						NODC 610951	Cr. T54
127.01 D-06	TUI	01/07/64	28/10/64	61a	37	(T, S, sig-t, SVA, ΔD, Vs) ◊	600-2000	2502						NODC 610008	Cr. T60
127.01 D-07	TUI	30/04/65	27/06/65	61a	37	(T, S, sig-t, SVA, ΔD, Vs) ◊	400-2500	2640						NODC 610952	Cr. T71
127.02 A-03	CANTERBURY, SOUTHLAND, WELLINGTON	04/03/87	15/12/87	61a 64 65					XTb-67 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) 073560 thru 073569	Cruise TOGA

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128.....	NORWAY														
128.01 K-01	SEAL ISLAND	15/11/86	29/11/86	57b 61b					XTb-20 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) 072976	
128.01 K-02	SEAL ISLAND	30/01/87	02/01/88	57b 61b					XTb-153 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) 072977 thru 072981	
128.01 K-03	SEAL ISLAND	26/02/88	22/11/88	57b 61b					XTb-181 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) ††	
130.....	PERU.....														
130.01 C-31	UNANUE	17/05/88	10/08/88	61b					XTb-19 ◊					NODC(BT) 076531,076532	
130.01 D-13	SNP-1	20/07/84	07/08/89	61b					XTb-150 ◊ ††					NODC(BT) 068411,069385 068844,068845 076534	
130.01 E-02	ALEJERO HUMBOLDT	23/11/82	30/07/89	61b					XTb-401 ◊ ††					NODC(BT) ††	
130.01 F-01	CHILOE III	08/04/84	06/05/84	61b					XTb-42 ◊					NODC(BT) 068697	
130.01 G-01	CARILLO	17/10/84	18/01/89	61b					XTb-128 ◊ ††					NODC(BT) ††	
131.....	PHILIPPINES														
131.02 A-02	JEBSEN TIMARU	10/03/87	01/11/87	56 57a 61a 64					XTb-65 ◊					NODC TOGA PACIFIC DATA BASE	
133.....	PORTUGAL														
133.01 D-10	ALMEIDA CARVALHO	24/10/72	05/11/72	23a	75	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-490	498						NODC 680044	Cruise CAPEC 8
133.01 D-11	ALMEIDA CARVALHO	22/01/73	15/02/73	23a	74	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-500	500						NODC 680050	Cruise CAPEC 9
135.....	SWEDEN.....														
135.01 J-02	ELGAREN	10/01/87	09/12/87	57b 61a 64					XTb-275 ◊					NODC TOGA PACIFIC DATA BASE	

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135.01 J-03	ELGAREN	01/01/88	09/06/88	57b 61a 64					XTb-85 ◊					NODC TOGA PACIFIC DATA BASE	
136.....	SOUTH AFRICA.....														
136.01 C-18	MEIRING NAUDE	13/08/68	20/09/68	45a	118	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	160-1000	1029						NODC 910118, 910124	Cruises 16 & 19
136.01 C-19	MEIRING NAUDE	20/08/73	21/09/73	45a	66	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	400-500	506					(T, S, sig-t, SVA, ΔD, Vs)-9 ◊	NODC 910117, 910123	Cruises 19 & 20
136.01 C-20	MEIRING NAUDE	06/08/74	17/09/74	45a	59	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	20-500	507						NODC 910116, 910122	Cruises 21 & 24
136.01 C-21	MEIRING NAUDE	23/07/75	23/09/75	45a	29	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	20-500	503						NODC 910112, 910121	Cruises 19 & 27
136.01 C-22	MEIRING NAUDE	03/08/76	10/08/76	45a	32	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	20-1000	1006						NODC 910114, 910119	Cruises 16 & 17
136.01 C-23	MEIRING NAUDE	10/08/77	15/09/77	45a	25	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	50-1050	1061						NODC 910115, 910120	Cruises 22 & 27
136.01 C-24	MEIRING NAUDE	16/10/72	27/10/72	45a	66	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	150-500	582					T-1 ◊	NODC 910128, 910130	Cruises 24 & 25
136.01 C-25	MEIRING NAUDE	12/11/73	16/11/73	45a	40	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	150-500	500						NODC 910134	Cruise 24
136.01 C-26	MEIRING NAUDE	08/08/75	06/11/75	45a	108	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	20-2500	2500						NODC 910133, 910135	Cruises 22 & 30

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136.01 C-27	MEIRING NAUDE	13/10/69	23/10/69	45a	80	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	8-39	49						NODC 910129	Cruise 31
136.01 C-28	MEIRING NAUDE	24/10/74	25/10/74	45a	20	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	20-500	505						NODC 910127	Cruise 29
136.01 C-29	MEIRING NAUDE	05/10/76	26/11/76	45a	31	(T, S, sig-t, SVA, ΔD, Vs, PO4, NO3, SiO4) ◊	10-380	383						NODC 910126, 910132	Cruises 20 & 26
136.01 I-02	FRAAY	02/06/66	24/06/66	45a	19	(T, S, sig-t, SVA, ΔD, Vs) ◊	360-2530	2955						NODC 910111	
136.01 I-03	FRAAY	24/08/67	06/09/67	45a									S-71 ◊	NODC 910125	
136.01 I-04	FRAAY	19/10/66	04/11/66	45a	73	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-1150	1170					T-1 ◊	NODC 910131	
137.....	U.S.S.R.....														
137.13 Q-02	SRTM 8-452	10/05/80	19/05/80	56	37	(T, S, sig-t, SVA, ΔD, Vs) ◊	200	200						NODC 907138	
138.....	UNITED KINGDOM.....														
138.02 K-07	ACT 3, BUNKER HILL, CAVARA, MANCHESTER	21/01/87	30/12/87	57b 61a 61b 64 65 66					XTb-352 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) 073098,073099	
138.02 K-08	ACT 3, ACT 4, ACT 6, FARNELLA, MANCHESTER	01/01/88	31/12/88	57b 61a 61b 64 65 66					XTb-528 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) ††	
138.05 B-28	DISCOVERY	02/04/89	01/05/89	23a	53 †	T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO3	160-4600	4600						Publication 38.14-378	Cruise 181
138.10 B-06	CHARLES DARWIN	11/07/90	20/07/90	23a	57 †	T, S, sig-t, SVA. ΔD, Vs, PO4, NO3, SiO3	400-2200	2353						Publication 38.14-376	Cruise 50

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139.....	UNITED STATES.....														
139.01 I-32	KNORR	11/05/76	20/12/76	23b	121 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-500, 2000-4800	4897						NODC 319385, 319386	Period: 11-21/5/76 and 1-20/12/76
139.01 I-33	KNORR	02/06/77	08/06/77	23a	23 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	1500-3700	3941						NODC 319394	
139.01 I-34	KNORR	24/11/87	06/03/88	23a 32a 32b	337	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO4) ◊	137-5650	5854						NODC 313522	Cruise 320
139.01 L-15	OCEANUS	23/07/88	27/08/88	23a 32b	133 †	T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO3	190-5700	5957				Wd, Ta, Bar		Publication 39.01-324	Cruise 202
139.01 L-16	OCEANUS	01/03/89	19/03/89	23a 23b	85	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO4) ◊	200-5890	5897						NODC 323110	
139.03 D-04	SERRANO														Deleted - pre-1950 data
139.04 B-01	T. G. THOMPSON	05/02/67	29/11/67	57b	77 † * (184)		10-200, 1480	1480						NODC 319770 *	Cruises 12, 19 & 23 77 CTD stations * (Change 3)
139.04 B-17	T. G. THOMPSON	29/07/82	14/08/82	57a 57b *	45 † * (88)									NODC 319935 *	Cruise 16 45 CTD stations * (Change 39)
139.04 B-25	T. G. THOMPSON	05/08/85	07/09/85	57a 57b	115 * (230) †			6238						NODC 313453 *	Cruise TT 190 115 CTD stations (Change 43)
139.04 B-32	T. G. THOMPSON	05/01/68	31/07/68	57b	208	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-5000	6100						NODC 311375	
139.04 B-33	T. G. THOMPSON	10/04/78	06/07/78	55	406 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-600	1400						NODC 319402	
139.04 B-34	T. G. THOMPSON	24/03/80	08/06/80	55	427 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-1400	1500						NODC 319410	
139.04 B-35	T. G. THOMPSON	11/04/81	21/07/81	55	515 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-1400	1700						NODC 319414 thru 319417	

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139.04 B-36	T. G. THOMPSON	15/06/82	23/07/82	57a	236 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	1000-6000	6290						NODC 318818, 319646 thru 319648	176 CTD stations
139.04 B-37	T. G. THOMPSON	30/10/83	08/11/83	57b	24 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	4000-6000	6079						NODC 319936	
139.04 B-38	T. G. THOMPSON	23/09/84	28/10/84	57a 57b	55 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	3500-6100	6258						NODC 319938	
139.04 B-39	T. G. THOMPSON	06/07/87	29/08/87	12 55	428 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-60	2400						NODC 319739 thru 319741	
139.04 B-40	T. G. THOMPSON	12/06/88	22/07/88	12 55	322 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-50	2400						NODC 319800, 319801	
139.08 N-17	THOMAS WASHINGTON	13/05/81	28/05/81	57a	22 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	5000-5800	5883						NODC 319389	
139.08 N-18	THOMAS WASHINGTON	01/10/84	22/10/84	32b	128 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	1400-1600 3500-5000	5205						NODC 313394, 319798	Cruise MARATHON 7 64 CTD stations
139.08 N-19	THOMAS WASHINGTON	13/09/88	19/10/88	12 55	242 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-60	60						NODC 319848, 319907	
139.08 Q-15	MELVILLE	09/11/88	06/03/89	32a 32b SO	217	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO4) ◊	200-6000	6070				(Wd, Ta, Tw, Cld, Bar) ◊	S-4 ◊ Wa ◊	NODC 313523, 313524	Cruise 336
139.08 Q-16	MELVILLE	11/11/83	02/12/83	32b SO	41 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	225-940	941						NODC 319999	Cruise AMERIEZ
139.08 Q-17	MELVILLE	08/03/86	27/03/86	32b SO	48 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	470-1480	1487						NODC 319503	Cruise AMERIEZ
139.08 V-14	NEW HORIZON	29/04/87	21/05/87	57b	183 †	T, S, sig-t, SVA, ΔD, O2, PO4, NO2, NO3, SiO3	80-540	543	XTb-184		Zoo-56 Pigm-151 PrPr-15	Wd, W, Ta, Tw, Cld, Bar	(T, S, sig-t, SVA, O2, PO4, NO2, SiO3)-91 †† Wa, Col, Tra	Publication 39.01-320	Cruise SQ87, Legs I & II 120 CTD stations

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139.08 V-15	NEW HORIZON	30/08/88	22/09/88	57b	362 †	T, S, sig-t, SVA, ΔD, O2, PO4, NO2, NO3, SiO3	60-_000	1000			Zoo-65 Pigm-146 PrPr-18	Wd, W, Ta, Tw, Cld, Bar	(T, S, sig-t, O2, PO4, NO2, NO3, SiO3)-73 †† Wa	Publication 39.01-321	Cruise FRONTS 88
139.10 GG-03	MILLER FREEMAN	11/04/69	05/08/69	55 57b	195	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-90, 500-1500	1500						NODC 311443, 313332	
139.15 C-16	YAQUINA	17/10/71	03/12/71	57b 61b	151	(T, S, sig-t, SVA, ΔD, Vs) ◊	600, 2000-4000	4322						NODC 312195	
139.15 C-17	YAQUINA	11/06/81	18/10/81	59	150 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-350	350						NODC 319156 thru 319160	
139.16 M-14	GLACIER	04/03/86	31/03/86	32b SO	66 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-1480	1486						NODC 319502	Cruise AMERIEZ
139.16 O-05	WESTWIND	09/11/83	01/12/83	32b SO	26 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	270-495	496						NODC 319998	Cruise AMERIEZ
139.20 H-01	ALPHA HELIX	11/09/90	12/09/90	58	19 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	160-275	275						NODC 319995	
139.23 A-31	RESEARCHER	18/05/83	24/07/83	57b 61b	114 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	1000	2400						NODC 319398, 319399	Cruise EPOCS
139.23 A-32	RESEARCHER	13/04/84	18/10/84	57b 61a 61b	22 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	990	3550						NODC 319837, 319838	Cruise EPOCS Period: 13/4-3/5/84 and 12-18/10/84
139.23 A-33	RESEARCHER	28/08/89	15/09/89	23b	54 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	800-4800	4892						NODC 319994	Cruise STACS
139.23 C-06	RANIER	28/04/75	13/05/75	58	138 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-1500	1500						NODC 319033, 319036	
139.23 D-34	ALBATROSS IV	23/09/81	04/11/81	23b	67 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	300-990	994						NODC 319951	Cruise 81-11, Warm Core Rings Program
139.23 D-35	ALBATROSS IV	22/04/82	19/08/82	23b	207 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-1000	1885						NODC 319952 thru 319954	Cruises 82-04, 82-07, 82-09, Warm Core Rings Program

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139.23 O-07	Ships of Opportunity	01/01/87	31/12/87	48 49 56 57a 57b 61a 61b 64 65					XTb-4,166 ◊					NODC TOGA PACIFIC DATA BASE	
139.23 O-08	Ships of Opportunity	01/01/88	31/12/88	49 50 56 57a 57b 61a 61b 64					XTb-2,423 ◊					NODC TOGA PACIFIC DATA BASE	
139.23 P-19	DELAWARE II	23/09/82	27/09/82	23b	29 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-990	990						NODC 319955	Cruise 82-06, Warm Core Rings Program
139.23 R-04	FERREL	20/04/70	22/06/70	23b	394 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	5-60	65					(T, S, sig-t, SVA, ΔD, Vs)-2 ◊	NODC 313518	
139.23 W-09	MCARTHUR	15/09/75	16/09/75	59	23 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-225	225						NODC 319022	
139.23 W-10	MCARTHUR	23/02/76	29/10/76	59	174 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	40-225	250						NODC 319030, 319058, 319059	Period: 23/2-15/4/76, 27-28/9/76 and 28-29/10/76
139.23 W-11	MCARTHUR	11/09/80	29/10/80	57b	167 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-45	120						NODC 319289	
139.23 W-12	MCARTHUR	23/03/81	20/11/81	59	464 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-200	223					(T, S, sig-t, SVA, ΔD, Vs)-1 ◊	NODC 319318, 319328	Period: 23/3-3/4/81 and 22/5-20/11/81
139.23 W-13	MCARTHUR	12/02/82	28/04/82	59	256 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-200	248						NODC 319325	
139.23 W-14	MCARTHUR	21/03/83	07/10/83	57b 59	248 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-400	693						NODC 319353, 319354, 319517	Period: 21/3-27/4/83 and 5-7/10/83
139.23 W-15	MCARTHUR	12/10/84	05/11/84	57b	26 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	225-1500	1900						NODC 319637	
139.23 W-16	MCARTHUR	21/05/85	08/06/85	57b	85 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	100-1500	1500						NODC 319645	

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139.23 W-17	MCARTHUR	25/03/86	15/04/86	57b	78 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	750,2400	2400						NODC 319710	
139.23 X-09	MILLER FREEMAN	05/11/76	19/11/76	58	152 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-500, 1500	1500						NODC 319076 thru 319078	
139.23 X-10	MILLER FREEMAN	02/04/80	14/04/80	58	40 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-250	297						NODC 319341	
139.23 X-11	MILLER FREEMAN	30/03/81	24/05/81	58	246 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-270	272						NODC 319348 thru 319350	
139.23 X-12	MILLER FREEMAN	13/02/83	24/02/83	55	41 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	40-300	372						NODC 319774	
139.23 X-13	MILLER FREEMAN	31/07/84	13/09/84	55	182 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-200	222						NODC 319772	
139.23 X-14	MILLER FREEMAN	23/01/85	11/05/85	55 58	125 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-300	595						NODC 319773, 319779, 319781 319782	
139.23 X-15	MILLER FREEMAN	11/02/86	19/10/86	55 57b 58	208 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-800	800						NODC 319742, 319783 thru 319786, 319788	Period: 11/2-18/5/86 and 19/9-19/10/86
139.23 X-16	MILLER FREEMAN	17/02/87	12/05/87	55 57b 58	169 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-750	800						NODC 319743, 319744, 319789	
139.23 X-17	MILLER FREEMAN	31/01/88	07/06/88	55 58	359 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-1500	1773						NODC 319984 thru 319987	
139.23 X-18	MILLER FREEMAN	22/03/89	27/09/89	55 58	423 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	50-1485	1485						NODC 319988 thru 319990	Period: 22/3-9/6/89 and 8-27/9/89
139.23 Y-25	DAVID STARR JORDAN	04/03/90	29/04/90	57b	132	T, S, sig-t, SVA, ΔD, O2, PO4, NO2, NO3, SiO3	50-590	592			Zoo-107 Pigm-132 PrPr-37	Wd, W, Ta, Tw, Cld, Bar	Wa, Col, Tra	Publication 39.01-323	Cruises CalCOFI 9003 & 9004
139.23 AA-01	KINGFISH	23/09/76	18/10/76	26	14	(T, S, sig-t, SVA, ΔD, Vs) ◊	15-20	24						NODC 313509, 313510	Cruises 11 & 12
139.23 BB-01	GUS III	24/05/76	04/12/76	26	57	(T, S, sig-t, SVA, ΔD, Vs) ◊	15-90	95						NODC 313507, 313508, 313511	Cruises 5, 9, 14
139.23 BB-02	GUS III	17/01/77	18/01/77	26	6	(T, S, sig-t, SVA, ΔD, Vs) ◊	16-24	24						NODC 313512	Cruise 1

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139.23 BB-03	GUS III	27/07/78	27/07/78	26	11	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	15-20	20						NODC 313514	
139.23 BB-04	GUS III	09/05/79	09/05/79	26	11	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	16-20	20						NODC 313517	
139.32 B-01	POLAR DUKE	17/07/88	12/08/88	32b SO	87 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	890-1486	1486						NODC 189003	Cruise AMERIEZ
139.39 A-01	LONGHORN	04/12/74	14/12/74	26	7 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	15-100	120					(T, S, sig-t, SVA, ΔD, Vs)-3 ◊	NODC 329454, 329455	Cruises 1 & 2, STOCS
139.39 A-02	LONGHORN	09/01/75	13/09/75	26	52 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	15-120	120					(T, S, sig-t, SVA, ΔD, Vs)-3 ◊	NODC 329456 thru 329464	Cruises 3, 5, 7-9, 11-14, STOCS
139.39 A-03	LONGHORN	14/01/76	02/12/76	26	142 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-125	125						NODC 329465 thru 329476	Cruises 16, 17, 23, 25, 27, 31, 34, 35, 38, 40, 45, 47, STOCS
139.39 A-04	LONGHORN	07/01/77	03/12/77	26	135 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	10-180	180						NODC 329477 thru 329490	Cruises 50-53, 57, 59, 62, 65, 67, 72, 75, 78, 85, 89, STOCS
139.40 A-01	ACANIA	01/08/82	12/08/82	57b	108 †	(T, S, sig-t, SVA, ΔD, Vs) ◊	475-1500	1500						NODC 329439	Cruise FRONTS
151.....	THAILAND														
151.01 A-04	OCEANOGRAPHIC VESSEL NO. 1	08/03/57	25/09/57	47	127	(T, S, sig-t, SVA, ΔD, Vs) ◊	5-50	65					(T, S, sig-t, SVA, ΔD, Vs)-28 ◊	NODC 861317	
151.01 A-05	OCEANOGRAPHIC VESSEL NO. 1	27/12/63	21/01/64	44 46a	62	(T, S, sig-t, SVA, ΔD, Vs) ◊	15-80	175						NODC 860002	
151.01 E-01	Ship not identified	05/09/83	05/09/83	47	2	(T, S, sig-t, SVA, ΔD, Vs) ◊	30, 50	50						NODC 861323	
156.....	PANAMA.....														
156.01 A-03	CAP ANAMUR, MICRONESIAN COMMERCE, MICRONESIAN INDEPENDENCE, MOANA PACIFIC, PACIFIC ISLANDER	01/01/87	31/12/87	56 57a 57b 61a					XTb-1,201 ◊					NODC TOGA PACIFIC DATA BASE	

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156.01 A-04	CAP ANAMUR, HIKAWA II, MICRONESIAN COMMERCE, MICRONESIAN INDEPENDENCE, MOANA PACIFIC, PACIFIC ISLANDER, PRESIDENTE IBANEZ	01/01/88	31/12/88	56 57a 57b 61a 61b					XTb- 1,127 ◊					NODC TOGA PACIFIC DATA BASE	
173.....	PEOPLE'S REPUBLIC OF CHINA.....														
173.01 A-08	SHIJIAN	26/04/73	02/05/73	50	61	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	83-156	157						NODC 760265	
173.01 A-09	SHIJIAN	13/08/74	21/12/74	50	156	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4, pH) ◊	75-180	181						NODC 760266 thru 760269	
173.01 A-10	SHIJIAN	07/01/78	11/03/78	50 51	58	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	60-90	90						NODC 760054, 760056, 760207 760209, 760272 Publication 73.07-004	
173.01 A-11	SHIJIAN	07/11/79	09/12/79	50	26	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	35-100	109						NODC 760078, 760273, 760274	
173.01 A-12	SHIJIAN	12/01/80	16/09/80	50 51	86	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	35-195	196						NODC 760068, 760216, 760220 760275, 760277 Publication 73.07-006	
173.01 A-13	SHIJIAN	03/04/85	10/08/85	50	48	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	80-200	200						NODC 760286 thru 760288	
173.01 A-14	SHIJIAN	17/02/87	16/05/87	50	25	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4, pH) ◊	60-200	200						NODC 760290, 760291	
173.01 A-15	SHIJIAN	17/08/88	19/08/88	50	11	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, PO4, SiO4, pH) ◊	70-800	837						NODC 760292	

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173.01 A-16	SHIJIAN	19/02/89	24/02/89	50	30	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, PO4, SiO4, pH) ◊	20-200	918						NODC 760293	
173.01 A-17	SHIJIAN	15/02/90	17/11/90	50	156	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, PO4, SiO4, pH) ◊	20-600	631						NODC 760294 thru 760296	
173.01 B-02	XIANGYANGHONG 09	18/12/80	21/12/80	51	19	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760221 Publication 73.07-006	
173.01 B-03	XIANGYANGHONG 09	12/06/84	31/12/84	50	129	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, PO4, SiO4, pH) ◊	20-195	197				(Wd, Ta, Tw, Cld, Bar) ◊	Wa ◊	NODC 760177 thru 760180	
173.01 B-04	XIANGYANGHONG 09	22/05/86	22/06/86	50 56 57a	86	(T, S, sig-t, SVA, ΔD, Vs, NO2, NO3, SiO4, pH) ◊	100-3050	3095				(Wd, Ta, Tw, Bar) ◊	Wa ◊	NODC 760193, 760194	
173.01 B-05	XIANGYANGHONG 09	10/04/89	08/11/89	50 56	184	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760528, 760529	
173.01 B-06	XIANGYANGHONG 09	27/07/90	27/08/90	50 56	106	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760530, 760531	
173.01 C-05	XIANGYANGHONG 01	17/10/75	28/10/75	50 51	38	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4, pH) ◊	15-150	200				(Wd, Ta, Tw, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760009	
173.01 C-06	XIANGYANGHONG 01	06/08/76	16/08/76	50	23	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760397	
173.01 C-07	XIANGYANGHONG 01	06/08/77	08/08/77	50	16	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760398	
173.01 C-08	XIANGYANGHONG 01	06/01/78	26/12/78	50	35	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-150	150						NODC 760055, 760403	Period: 6-8/1/78 and 24-26/12/78

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173.01 C-09	XIANGYANGHONG 01	09/01/79	06/12/79	50	86	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-150	150						NODC 760072, 760075,760079 760406,760407	
173.01 C-10	XIANGYANGHONG 01	02/02/80	08/10/80	50	96	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-150	150						NODC 760064, 760066,760070 760409,760412 760413	
173.01 C-11	XIANGYANGHONG 01	06/11/85	12/11/85	50	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760421	
173.01 D-02	XIANGYANGHONG 08	22/07/78	23/07/78	51	7	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760210 Publication 73.07-004	
173.01 D-03	XIANGYANGHONG 08	26/01/86	11/10/86	51	17	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, PO4, SiO4, pH) ◊	35-75	75				(Wd, Ta, Tw, Cld, Bar) ◊		NODC 760181, 760183,760184	
173.01 E-05	XIANGYANGHONG 10	17/12/80	23/12/80	51	29	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760222, 760532 Publication 73.07-006	
173.01 E-06	XIANGYANGHONG 10	16/10/81	16/10/81	49	4	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760552	
173.01 E-07	XIANGYANGHONG 10	18/02/86	11/08/86	50	108	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4, pH) ◊	20-200	200				(Wd, Ta, Tw, Cld, Bar) ◊	Wa ◊	NODC 760185, 760188,760190	
173.01 E-08	XIANGYANGHONG 10	11/06/87	19/11/87	50	52	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760544 thru 760546	
173.01 E-09	XIANGYANGHONG 10	03/02/88	16/11/88	50	43	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760547 thru 760550	
173.01 E-10	XIANGYANGHONG 10	12/05/89	17/05/89	50	32	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760551	
173.01 F-02	SHUGUANG 04	11/07/76	14/07/76	51	19	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-80	82						NODC 760024	
173.01 F-03	SHUGUANG 04	06/01/77	20/12/77	50 51	19	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-85	88						NODC 760037, 760041,760358	Period: 6-7/1/77 and 18-20/12/77

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173.01 F-04	SHUGUANG 04	07/01/78	14/07/78	51	30	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760206, 760211 Publication 73.07-004	
173.01 G-05	SHUGUANG 06	18/12/75	20/12/75	50	15	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4, pH) ◊	20-150	150				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760011, 760359	
173.01 G-06	SHUGUANG 06	08/02/76	09/10/76	50 51	84	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760015, 760017,760019 760039,760360	
173.01 G-07	SHUGUANG 06	09/04/77	13/10/77	50	25	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-105	111						NODC 760028, 760030,760053	
173.01 G-08	SHUGUANG 06	03/02/78	21/09/78	50	134	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760058, 760060,760062 760364,760365 760367,760369	
173.01 G-09	SHUGUANG 06	11/02/79	05/09/79	50	78	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760074, 760077,760371 760373	
173.01 G-10	SHUGUANG 06	04/08/80	06/10/80	50	33	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760069, 760375	
173.01 H-04	SHUGUANG 07	04/04/76	14/12/76	50 51	82	(T, S, sig-t, SVA, ΔD, Vs) ◊	14-114	114						NODC 760016, 760018,760020 760021,760023 760027	
173.01 H-05	SHUGUANG 07	07/12/77	10/12/77	50 51	28	(T, S, sig-t, SVA, ΔD, Vs) ◊	20-100	113						NODC 760035, 760043	
173.01 H-06	SHUGUANG 07	03/07/78	21/09/78	51	37	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760059, 760061,760212 760214 Publication 73.07-004	
173.01 H-07	SHUGUANG 07	08/01/79	04/09/79	50	44	(T, S, sig-t, SVA, ΔD, Vs) ◊	35-110	112						NODC 760071, 760073,760076	
173.01 H-08	SHUGUANG 07	05/03/80	18/04/80	50 51	44	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760063, 760065,760067 760218 Publication 73.07-006	

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173.01 H-09	SHUGUANG 07	12/03/81	11/10/81	50	25	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760224, 760230	Period: 12-13/3/81 and 10-11/10/81
173.01 I-03	XIANGYANGHONG 16	01/02/83	02/02/83	49	3	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760575	
173.01 I-04	XIANGYANGHONG 16	27/01/85	11/05/85	50	30	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760579, 760580	
173.01 I-05	XIANGYANGHONG 16	10/09/86	13/11/86	50	63	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4, pH) ◊	20-200	200				(Wd, Ta, Tw, Cld, Bar) ◊	Wa ◊	NODC 760191, 760192	
173.01 I-06	XIANGYANGHONG 16	10/08/89	08/11/89	50	64	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760583, 760584	
173.01 I-07	XIANGYANGHONG 16	17/08/90	28/08/90	50	37	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760585	
173.01 J-01	DONG FANG HONG	30/07/66	16/09/66	50	8	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	66-90	90						NODC 760263, 760264	
173.01 K-01	SHIP 3	08/05/84	08/05/84	49	2	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	81, 109	109						NODC 760262	
173.01 L-01	XIANGYANGHONG 04	22/04/75	19/12/75	50	87	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, SiO4, pH) ◊	20-150	150				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760005, 760007, 760010 760080, 760478	
173.01 L-02	XIANGYANGHONG 04	10/04/77	20/11/77	50	84	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760029, 760031, 760032 760484, 760485	
173.01 L-03	XIANGYANGHONG 04	13/03/78	10/04/78	50	30	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760057, 760486	
173.01 L-04	XIANGYANGHONG 04	11/05/79	17/05/79	50	15	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760487	

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173.01 M-01	XIANGYANGHONG 07	13/12/76	14/12/76	51	3	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-72	72						NODC 760025	
173.01 M-02	XIANGYANGHONG 07	18/12/77	19/12/77	51	12	(T, S, sig-t, SVA, ΔD, Vs) ◊	34-87	87						NODC 760042	
173.01 M-03	XIANGYANGHONG 07	17/03/78	21/03/78	51	19	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760208 Publication 73.07-004	
173.01 M-04	XIANGYANGHONG 07	13/07/80	18/07/80	51	18	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760219 Publication 73.07-006	
173.01 M-05	XIANGYANGHONG 07	19/05/86	20/05/86	51	6	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, PO4, SiO4, pH) ◊	35-75	78				(Wd, Ta, Tw, Cld, Bar) ◊	Wa ◊	NODC 760182	
173.01 N-01	SHUGUANG 05	08/04/76	13/12/76	51	29	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-85	85						NODC 760022, 760026	
173.01 N-02	SHUGUANG 05	06/01/77	23/09/77	51	45	(T, S, sig-t, SVA, ΔD, Vs) ◊	30-88	88						NODC 760036, 760038, 760040	
173.01 N-03	SHUGUANG 05	13/09/78	21/09/78	51	18	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760213 Publication 73.07-004	
173.01 N-04	SHUGUANG 05	11/01/80	24/04/80	51	34	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-80	80						NODC 760215, 760217 Publication 73.07-006	
173.01 O-01	SHUGUANG 08	12/02/77	07/08/77	50	11	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760381, 760382	
173.01 O-02	SHUGUANG 08	06/06/78	17/11/78	50	53	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760383, 760384, 760385	
173.01 O-03	SHUGUANG 08	03/09/79	11/10/79	50	17	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760386, 760387	
173.01 O-04	SHUGUANG 08	09/01/80	07/06/80	50	45	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760388 thru 760391	

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173.01 O-05	SHUGUANG 08	13/05/81	10/09/81	50	42	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760392 thru 760394	
173.01 O-06	SHUGUANG 08	12/06/84	13/06/84	50	16	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760396	
173.01 P-01	SHUIXING	08/06/66	21/10/66	50	12	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760614 thru 760616	
173.01 Q-01	SUILIAN 220	29/04/59	08/09/59	49	52	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760625 thru 760628	
173.01 R-01	ZEWEN 125	26/12/85	28/12/85	49	5	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760643	
173.01 S-01	SHUTONGYU 1	07/04/86	07/04/86	50	12	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760641	
173.01 T-01	SHUTONGYU 2	06/09/85	08/09/85	50	17	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760642	
173.01 U-01	SHANGBAN	25/04/84	05/05/84	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760636	
173.01 V-01	KUYU 401	11/03/59	08/12/59	50	78	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC760637 thru 760640	
173.01 W-01	KANG GONG I	15/05/59	16/08/59	49	65	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760629 thru 760631	
173.01 W-02	KANG GONG I	17/03/60	15/09/60	49	78	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760632 thru 760635	
173.01 X-01	3-101	18/03/60	19/03/60	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760617	
173.01 Y-01	3-141	29/10/59	17/12/59	49	39	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760618, 760619	

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173.01 Y-02	3-141	17/03/60	08/04/60	49	26	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760620, 760621	
173.01 Z-01	3-151	12/06/59	13/06/59	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760622	
173.01 AA-01	CHANGSHENG	05/03/72	10/05/72	49	52	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	35-100	106						NODC 760297, 760298	
173.01 AA-02	CHANGSHENG	11/07/78	24/09/78	49	17	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	80-300	300						NODC 760299 thru 760301	
173.01 AA-03	CHANGSHENG	21/04/79	21/04/79	49	2	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	100-160	166						NODC 760302	
173.01 BB-01	HAI DIAO 10	14/08/60	11/11/60	49	26	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760586, 760587	
173.01 CC-01	HAI DIAO 822	10/03/66	10/03/66	50	4	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760588	
173.01 DD-01	HAI JIAN 40	09/04/87	10/04/87	50	15	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760645	
173.01 EE-01	HAI JIAN 47	22/09/87	23/09/87	50	14	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760644	
173.01 FF-01	HAI JIAN 71	16/08/89	19/08/89	49	17	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760646	
173.01 GG-01	HAI JIAN 72	16/08/89	19/08/89	49	24	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760649	
173.01 GG-02	HAI JIAN 72	23/05/90	03/06/90	49	41	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760650	

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173.01 HH-01	HAI JIAN 73	21/06/87	27/06/87	49	16	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760623	
173.02 B-01	XIANGYANGHONG 05	18/11/86	16/12/86	56 57a 61a	71 * (143) †	O2 *	200-300, 1800-4500	4500						NODC 760081 *	US-PRC Cooperative Study, Cruise PRC-2 Legs 1 and 2, TOGA 72 STD stations (Change 44)
173.02 B-02	XIANGYANGHONG 05	10/03/73	31/08/73	49	65	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760488 thru 760490	
173.02 B-03	XIANGYANGHONG 05	12/04/75	17/04/75	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760491	
173.02 B-04	XIANGYANGHONG 05	11/04/76	06/05/76	57a 57b 61a	65	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	500-3000	3000						NODC 760492	
173.02 B-05	XIANGYANGHONG 05	02/04/78	16/12/78	49 57a 57b 61a	130	(T, S, sig-t, ΔD, Vs, O2, pH) ◊	500-3000	3000				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760112, 760493, 760494	
173.02 B-06	XIANGYANGHONG 05	23/10/80	22/11/80	49	48	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	15-650	653				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760151, 760152	
173.02 B-07	XIANGYANGHONG 05	20/02/81	27/09/81	49	61	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-550	551				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760154, 760155, 760164	Period: 20/2-12/4/81 and 25-27/9/81
173.02 B-08	XIANGYANGHONG 05	13/10/82	19/10/82	49	24	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-400	579				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760174	
173.02 B-09	XIANGYANGHONG 05	12/09/83	25/09/83	49	40	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760502	
173.02 B-10	XIANGYANGHONG 05	29/07/84	01/01/85	49	102	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760503 thru 760505	
173.02 B-11	XIANGYANGHONG 05	07/08/85	29/12/85	49	47	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760506 thru 760508	

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173.02 B-12	XIANGYANGHONG 05	21/02/86	10/04/86	49	41	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760509, 760510	
173.02 B-13	XIANGYANGHONG 05	22/09/87	22/10/87	56 57a 61a	91	(T, S, sig-t, SVA, ΔD, Vs, O2, PO4, NO2, NO3, SiO4) ◊	200-300, 1000	1000						NODC 760082	
173.02 B-14	XIANGYANGHONG 05	06/02/88	28/12/88	49	107	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760511 thru 760516	
173.02 B-15	XIANGYANGHONG 05	22/02/89	23/11/89	49	106	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760517 thru 760519	
173.02 B-16	XIANGYANGHONG 05	17/03/90	28/03/90	49	22	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760520	
173.02 C-05	XIANGYANGHONG 14	16/10/89	21/11/89	56 57a	53	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, SiO4) ◊	200-300	300						NODC 760259	
173.02 C-06	XIANGYANGHONG 14	15/10/81	21/12/81	49	56	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-500	694				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760167 thru 760169	
173.02 C-07	XIANGYANGHONG 14	06/06/82	20/12/82	49	78	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-600	694				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760172, 760173, 760175	
173.02 C-08	XIANGYANGHONG 14	01/02/83	20/12/83	49	59	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760558 thru 760560	
173.02 C-09	XIANGYANGHONG 14	20/04/84	15/12/84	49	99	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760561 thru 760564	
173.02 C-10	XIANGYANGHONG 14	08/02/85	11/06/85	49	59	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760565 thru 760567	
173.02 C-11	XIANGYANGHONG 14	06/08/86	16/12/86	49	62	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760568 thru 760570	

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173.02 C-12	XIANGYANGHONG 14	16/02/87	20/04/87	49	49	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760571, 760572	
173.02 C-13	XIANGYANGHONG 14	01/06/90	28/11/90	49 56 57a 61a	180	(T, S, sig-t, SVA, ΔD, Vs, O2,NO2, NO3, PO4, SiO4) ◊								NODC 760260, 760573,760574	
173.02 D-03	XIANGYANGHONG 14	25/01/87	24/10/87	49 56 57a 61a					XTb-207 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) 070531,070532 070539	
173.02 D-04	XIANGYANGHONG 14	21/04/88	31/12/88	49 56 57a 61a					XTb-282 ◊					NODC TOGA PACIFIC DATA BASE NODC(BT) 073515,073524 073529,077137	
173.02 E-01	CHANG ZHOU	10/07/78	17/11/78	49	35	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-300	300				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760101 thru 760103	
173.02 E-02	CHANG ZHOU	20/04/79	22/04/79	49	11	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-160	166				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760119	
173.02 F-01	SHUGUANG 01	15/04/78	17/11/78	49	70	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-450	719				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760099, 760100,760105 760107,760111 760311	
173.02 F-02	SHUGUANG 01	17/01/79	27/03/79	49	37	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-300	300				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760114, 760115,760117	
173.02 F-03	SHUGUANG 01	13/05/80	26/09/80	49	52	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-540	547				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760142, 760144,760147 760149	
173.02 F-04	SHUGUANG 01	15/05/81	15/08/81	49	26	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-300	300				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760156, 760162	
173.02 F-05	SHUGUANG 01	15/05/72	06/08/72	49	52	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	88-100	101						NODC 760303 thru 760305	

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COUNTRY/ CATALOGUE NUMBER	COUNTRY/ SHIP OR FIXED STATION	START DATE	END DATE	IHB REG.	TYPES OF OBSERVATIONS: OCEANOGRAPHIC SERIAL STATIONS NO. OF STAS.	PHYS. & CHEM. DATA	SAMPLE DEPTHS	MAX. DEPTH	BATHY-THERMO-GRAPH	CURRENTS	BIO-LOGICAL	METEORO-LOGICAL	SEA SURFACE	DATA CENTER REFERENCE NUMBER	REMARKS
173.02 F-06	SHUGUANG 01	22/06/75	24/06/75	49	11	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	300-1150	1483						NODC 760306	
173.02 F-07	SHUGUANG 01	16/07/76	12/08/76	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760047, 760308	
173.02 F-08	SHUGUANG 01	10/04/90	27/08/90	50	41	(T, S, sig-t, SVA, ΔD, Vs, O2, NO2, NO3, PO4, SiO4, pH) ◊	30-690	690						NODC 760324, 760325	
173.02 G-01	SHUGUANG 02	05/02/77	06/11/77	49	67	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-500	713				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760049, 760083,760087 760091,760093	
173.02 G-02	SHUGUANG 02	10/01/79	22/08/79	49	72	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-280	280				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760113, 760116,760122 760124,760127	
173.02 G-03	SHUGUANG 02	19/01/80	19/04/80	49	39	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-300	300				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760134, 760138,760140	
173.02 G-04	SHUGUANG 02	17/06/81	27/07/81	49	23	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-300	300				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760158, 760160	
173.02 G-05	SHUGUANG 02	17/04/82	18/04/82	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-260	260				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760171	
173.02 G-06	SHUGUANG 02	11/03/72	10/08/72	49	26	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	105	105						NODC 760326, 760327	
173.02 G-07	SHUGUANG 02	23/03/73	15/05/73	49	65	(T, S, sig-t, SVA, ΔD, Vs, O2) ◊	80-150	152						NODC 760328, 760329	
173.02 G-08	SHUGUANG 02	15/07/76	13/12/76	49	28	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760046, 760331 thru 760333	
173.02 H-01	SHUGUANG 03	10/02/77	06/11/77	49	53	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	30-700	776				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760050, 760051,760084 760092	

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COUNTRY/ CATALOGUE NUMBER	COUNTRY/ SHIP OR FIXED STATION	START DATE	END DATE	IHB REG.	TYPES OF OBSERVATIONS: OCEANOGRAPHIC SERIAL STATIONS NO. OF STAS.	PHYS. & CHEM. DATA	SAMPLE DEPTHS	MAX. DEPTH	BATHY-THERMO-GRAPH	CURRENTS	BIO-LOGICAL	METEORO-LOGICAL	SEA SURFACE	DATA CENTER REFERENCE NUMBER	REMARKS
173.02 H-02	SHUGUANG 03	22/02/78	21/10/78	49	47	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-600	750				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760097, 760098, 760104 760109	
173.02 H-03	SHUGUANG 03	11/05/75	14/05/75	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760349	
173.02 I-01	XIANGYANGHONG 02	08/06/73	25/09/73	49	47	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760422 thru 760424	
173.02 I-02	XIANGYANGHONG 02	22/07/75	25/09/75	49	38	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760002, 760426, 760427	
173.02 I-03	XIANGYANGHONG 02	11/03/76	06/04/76	49	20	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760045, 760429	
173.02 I-04	XIANGYANGHONG 02	13/05/77	15/12/77	49	56	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-700	761				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760052, 760086, 760089	
173.02 I-05	XIANGYANGHONG 02	24/10/79	09/12/79	49	36	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-600	610				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760130, 760131, 760133	
173.02 I-06	XIANGYANGHONG 02	17/01/80	22/12/80	49	89	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-785	785				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760135, 760136, 760143 760146, 760150 760153, 760441 760443	
173.02 I-07	XIANGYANGHONG 02	19/09/81	27/09/81	49	9	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-100	136				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760165	
173.02 I-08	XIANGYANGHONG 02	17/04/82	18/04/82	49	13	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-600	790				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760170	
173.02 I-09	XIANGYANGHONG 02	11/06/83	23/06/83	49	22	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760447	
173.02 J-01	XIANGYANGHONG 03	13/09/75	11/10/75	49	22	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760003, 760448	

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173.02 J-02	XIANGYANGHONG 03	09/01/76	10/06/76	49	53	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760044, 760451 thru 760453	
173.02 J-03	XIANGYANGHONG 03	27/03/79	08/12/79	49	134	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-600	774				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760118, 760120,760121 760123,760125 760126,760128 760129,760132 760176	
173.02 J-04	XIANGYANGHONG 03	23/02/80	14/08/80	49	65	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-700	830				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760137, 760139,760141 760145,760148	
173.02 J-05	XIANGYANGHONG 03	15/05/81	20/10/81	49	65	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-800	809				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760157, 760159,760161 760163,760166	
173.02 J-06	XIANGYANGHONG 03	11/08/83	21/10/83	49	27	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50	150	150					NODC 760473, 760474	
173.02 J-07	XIANGYANGHONG 03	16/02/84	23/02/84	49	20	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760475	
173.02 K-01	XIANGYANGHONG 06	15/09/76	16/12/76	49	38	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150						NODC 760048, 760521,760523	
173.02 K-02	XIANGYANGHONG 06	09/01/78	10/10/78	49	56	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	50-150	150				(Wd, Ta, Tw, Cld, Bar) ◊	(Wa, Col, Tra) ◊	NODC 760095, 760096,760108 760526	
173.02 L-01	JINXING	03/02/59	23/06/59	50	104	(T, S, sig-t, SVA, ΔD, Vs, O2, pH) ◊	20-150	150						NODC 760611 thru 760613	
180.....	LIBERIA.....														
180.01 A-03	MT. CABRITE, PAC MONARCH, PAC PRINCE, PAC PRINCESS, POLYNESIA, SANTA LUCIA, SKRIM	01/01/87	31/12/87	57a 57b 61a 61b					XTb-587 ◊					NODC TOGA PACIFIC DATA BASE	
180.01 A-04	MT. CABRITE, PAC KING, PAC PRINCE, PAC PRINCESS, POLYNESIA, SANTA LUCIA, SEDCO/BP471	01/01/88	31/12/88	48 56 57a 57b 61a 61b 64 66					XTb-637 ◊					NODC TOGA PACIFIC DATA BASE	

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WDC-A, OCEANOGRAPHY DATA INFORMATION

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181.....	SINGAPORE.....														
181.01 A-02	ANRO ASIA	07/02/87	19/11/87	48g 48h 48i 48j					XTb-62 ◊					NODC TOGA PACIFIC DATA BASE	
181.01 A-03	ANRO ASIA	18/01/88	28/11/88	48g 48i 48j					XTb-39 ◊					NODC TOGA PACIFIC DATA BASE	
214.....	GERMANY (Federal Republic).....														
214.01	DEUTSCHE BUCHT (LV), ELBE 1 (LV), FEHMARNBELT (LV), Kiel (LH), Nordsee (Platform), TW/EMS (LV)	01/01/57	31/12/89	1 4	1,242 * ††	T, S	13-25	30				Wd, Ta		Publication 14.02-218 *	* Period: 1/1/57-12/31/59 and 1/1/68-31/12/89 Total Stats: 10,272 Total Currents: 327,301 †† (Change 46)
224.....	JAPAN.....														
224.01 A-12	Ocean Data Buoys	01/01/89	31/12/89	50 52 56 57a								Wd, Ta, Tw, Bar, Sol Rad	T †† Wa	Publication 24.07-082	
224.01 A-13	Ocean Data Buoys	01/01/90	31/12/90	50 52 56 57a								Wd, Ta, Tw, Bar, Sol Rad	T †† Wa	Publication 24.07-084	
239.02	Neah Bay	01/01/61	12/01/90	57b									T, S, sig-t	Publication 39.01-322 *	* Period: Add 1990 (Change 46)
242.....	YUGOSLAVIA														
242.02 A-03	BIOS	06/01/71	14/11/83	28Bg	1,600 ††	T, S, Cl, sig-t, O2, PO4, NO2, NO3, NH4, SiO2, pH	5-260, 1190	1190		Surf-68 Subs-83		Wd, W, Ta, Tw, Cld, Bar, Hum, Vis	Wa, Tra	Publication 42.01-123	

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PART III
REMARKS

REMARKS

110.03 A-03 REF. NO: NODC(BT) 073230 thru 073232, 073247, 073248

125.04 A-01 REF.NO: NODC(BT) 069992 thru 069996, 073512, 073513, 073254, 073255

125.04 B-01 REF.NO: NODC(BT) 076522 thru 076527

126.02 B-03 REF. NO: NODC(BT) 070284 thru 070289, 070293 thru 070297, 070503, 070541, 072995, 073131, 073273, 073861 thru 073863, 073865, 073866

126.02 B-04 REF. NO: NODC(BT)073131, 073274, 073863, 073866, 074002, 074805, 075512, 075516

128.01 K-03 REF. NO: NODC(BT) 074392, 074393, 074678, 074679, 075718

130.01 D-13

NODC(BT) NO.	PERIOD	NO. XBT OBS.
068411	20/7-21/9/84	73
069385	24-25/7/85	8
068844	20/4-9/5/86	52
068845	21-22/8/86	10
076534	7/8/89	7

130.01 E-02

NODC(BT) NO.	PERIOD	NO. XBT OBS.
057845	23/11-3/12/82	77
057846	16-22/12/82	32
057844	26/1-5/2/83	67
057847	17/3-3/5/83	99
068424	16-21/11/84	9
068843	5-15/7/84	21
069378	12-13/7/84	6
069379	15-16/11/84	13
073250	28/1-9/2/87	34
076528	28-29/2/88	8
076529	15/6-7/7/88	27
076530	29-30/7/89	8

130.01 G-01

NODC(BT) NO.	PERIOD	NO. XBT OBS.
069380	17-18/10/84	12
069382	27-28/12/84	18
069381	13-15/3/85	10
070002	6/11-3/12/85	39
073251	26-28/2/86	11
073252	25-26/3/86	10
070000	29/5/86	9
073253	27-28/1/87	10
076533	187/1/89	9

138.02 K-08 REF. NO: NODC(BT) 076490, 076491, 076493, 076494, 076499 thru 076505, 077134

139.08 V-14 SEA SURFACE: Single readings at depths ranging between 5 and 26 m

139.08 V-15 SEA SURFACE: Single readings at depths ranging between 2 and 5 m

214.01 NO. OF STAS.: New Total - 10,272

NOTE: WDC-A, Oceanography maintains detailed information concerning numbers of stations and numbers of current observations, archived by year, for each Light Vessel. This information is available upon request

224.01 A-12 SEA SURFACE: T (Single observations at 1, 50, and 100 m)

224.01 A-13 SEA SURFACE: T (Single observations at 1, 50, and 100 m)

242.02 A-03

YEAR	NO. OF STAS.	YEAR	NO. OF STAS.
1971	118	1978	98
1972	170	1979	100
1973	222	1980	117
1974	139	1981	61
1975	153	1982	27
1976	199	1983	4
1977	192		

TRACK CHARTS

Track charts are available from WDC-A, Oceanography for cruises represented by the following Catalogue Numbers:

WDC-A Catalogue Number	Page No.
114.01 T-02	34
114.05 A-18	34
114.12 B-01	34
124.13 E-69	36
124.16 A-32	36
124.31 B-06	36
138.05 B-28	40
138.10 B-06	40
139.01 L-15	41
139.08 V-14	42
139.08 V-15	43
139.23 Y-25	45

PART IV

DATA HOLDINGS OF RNODC's AND SPECIALIZED DATA CENTERS

DATA HOLDINGS OF RNODC's AND SPECIALIZED DATA CENTERS

This section of the Change Notice provides information on the availability of specialized data sets prepared by the various Responsible National Oceanographic Data Centers (RNODC's) and other Specialized Data Centers. Only those data sets that have actually been received by WDC-A, Oceanography are described in this section. WDC-A can provide magnetic tape copies of these data sets in the originator's format.

These data products are not described in the usual manner in the Catalogue portion of the Change Notice (except for certain separately-identified cruises that are also included in data sets such as FOY), as the data are not usually merged with the standard WDC-A, Oceanography data bases. Thus they constitute a suite of data products, prepared by RNODC's and other Specialized Data Centers, that are separate and distinct from the standard data types regularly catalogued in the Change Notices and normally available from WDC-A.

Such data products are not necessarily intended to be routinely exchanged by the WDC's under normal international data exchange guidelines. They may be voluminous or costly to prepare and, thus, may be precluded from regular data exchanges between WDC's and their exchange cooperators. Data sets in automated form are available from the WDC's usually at a cost not to exceed the cost of reproduction and postage.

MEDALPEX

IGOSS

THE GLOBAL WEATHER EXPERIMENT • 1978–1979 •

SOC

TROPICAL OCEANS GLOBAL ATMOSPHERE

RNODC FOY

FGGE OPERATIONAL YEAR GLOBAL OCEAN CLIMATE DATA BASE

The National Oceanographic Data Center (NODC) is pleased to announce the availability of the Global Ocean Climate Data Base compiled as part of its efforts as the Responsible National Oceanographic Data Center for the FGGE* Operational Year (RNODC/FOY). The Global Ocean Climate Data Base is a collection of Oceangraphic data submitted to NODC by 17 different countries. Although the formal FGGE Operational Year was from 1 December 1978 to 30 November 1979, the data set covers the extended FOY period from 1 September 1978 to 29 February 1980.

The data base includes four types of data: (1) oceanographic hydrocast (bottle) data, (2) conductivity/ salinity-temperature-depth (C/STD) data, (3) expendable bathythermograph (XBT) data, and (4) Eulerian currrent (current meter) data. The data are recorded on magnetic tape in two different formats: (1) the Intergovernmental Oceanographic Commission General Exchange Format 3 (GF3) and (2) NODC archive formats (different format for each of the four types of data). In GF3 the data base comprises eight magnetic tapes; in the NODC formats the data base comprises four tapes.

The FGGE Operational Year was the culmination of a series of international ocean/atmosphere research programs conducted in the 1970's. This effort, in turn, was a steppingstone toward the increasingly ambitious and large-scale research and monitoring pro-grams of the 1980's and 1990's that are directed toward fuller understanding of tropical dynamics and their influence on global ocean/atmosphere phenomena.

**FGGE = First GARP Global Experiment, also known as the Global Weather Experiment.*
GARP = Global Atmosphere Research Program.

The FGGE/FOY Data Base

The FGGE/FOY Global Ocean Climate Data Base compiled by the RNODC contains: 10,413 Oceanographic hydrocast (bottle) stations; 4,030 CTD/STD casts; 28,733 expendable bathythermograph (XBT) temperature profiles; and 294 months of time-series data from current meter moorings. The sources of these data are summarized in Table 1.

Table 1. FGGE Operational Year Global Ocean Climate Data Base

Country	Data Type			
	Oceanographic Stations *(stations)*	**CTD/STD** *(stations)*	**XBT** *(stations)*	**Current Meter** *(meter-months)*
Australia	--	--	2,754	--
Canada	324	--	507	--
People's Republic of China	318	--	--	--
Republic of the Congo	307	--	--	--
France	--	--	307	--
German Democratic Republic	74	--	--	--
Federal Republic of Germany	--	--	1,366	--
Ghana	335	--	--	--
Italy	--	--	55	--
Japan	1,138	--	832	--
Philippines	--	--	8	--
Poland	87	--	267	--
Republic of South Africa	--	--	56	--
Spain	--	--	180	--
UK	--	64	944	--
USA	1,271	3,966	20,727	294
USSR	6,559	--	730	--
TOTAL	**10,413**	**4,030**	**28,733**	**294**

Table 2 lists the number of tapes included in the data set. Customers may order the entire set of tapes or only the tape(s) for one or more of the four different data types in either of the two format options.

Table 2. FOY Global Ocean Climate Data Tapes

Data Type	Data Quantity	Number of Tapes: GF3 Format *(1600 bpi)*	Number of Tapes: NODC Format *(6250 bpi)**
Oceanographic Station (hydrocast)	10,413 stations *(128 cruises)*	2	1
CTD/STD	4,030 stations *(62 cruises)*	1	1
XBT	28,733 stations *(571 cruises)*	3	1
Current Meter	294 months *(27 meters)*	2	1
	TOTAL	8	4

**Data tapes in NODC archive formats are also available by special request in 1600 bpi density*

Data Availability

Magnetic tape copies of the FOY Global Ocean Climate Data Base are available from the RNODC in either GF3 format or in NODC archive formats. Magnetic tape characteristics are: (1) GF3 format -- 9 track, 1600bpi, ANSI/ASCII, non-labeled, record length = 1920, unblocked; (2) NODC formats -- 9 track, 6250 bpi, ANSI/ASCII, non-labeled, variable record length, maximum blocksize = 4,160 (oceanographic station and CTD/STD data), 2,600 (XBT data), and any multiple of 60 (current meter data).

Complete sets of tapes or individual tapes are available at the cost of tape reproduction from:

World Data Center A, Oceanography
NOAA
Washington, DC 20235
USA

Telephone: 202-606-4571 or FTS 266-4571
Electronic mail *NODC.WDCA* on
TELEMAIL/Omnet

RNODC MEDALPEX (Sea Level)

Mediterranean Alpine Experiment
Sea Level Data Set

In 1975, the IOC decided to support the development of an oceanographic program in the Mediterranean during the GARP Alpine Experiment (ALPEX). The MEDALPEX project took place between 1 September 1981 and 30 September 1982, with a special period of observation from 15 February 1982 to 30 April 1982. It was a multi-national project involving scientists from 7 countries.

The main purpose of MEDALPEX was to increase understanding of the effect of wind forcing on the dynamics of the western part of the Mediterranean Basin. Specific studies were undertaken, each having a particular scientific objective including:

1. The interrelationship between the general circulation and mesoscale eddies

2. Offshore dynamic response mechanisms under severe weather conditions

3. Storm surges and the piling up of water, especially in the Adriatic and Ligurian seas

The measurement of sea level was considered to be an important component of the observation program to support these studies. A wide range of other types of oceanographic data were also collected, including classical and synoptic meteorological measurements, data collected using remote sensing techniques and data from current meters, thermistor chains, waverider buoys, CTDs and XBTs.

The Permanent Service for Mean Sea Level (PSMSL) was requested by IOC to fulfil the role of the Responsible National Oceanographic Data Center for the MEDALPEX sea level data. The work was undertaken on behalf of PSMSL by the Marine Information and Advisory Service (MIAS) - U.K.'s National Oceanographic Data Center.

Sea level data were submitted to MIAS from 29 of the 40 MEDALPEX sites. An inventory of the data is given on the following page. Measurements from 28 of the sites were taken using conventional stilling wells and, with one exception, were supplied to MIAS as hourly values. Data from the remaining site, off the coast of Corsica, were collected by an Aanderaa water level recorder at half-hourly intervals.

INVENTORY OF DATA RECEIVED

BY MEDALPEX SEA LEVEL DATA CENTER

SITE	LATITUDE	LONGITUDE	START DATE	SERIES DURATION	CYCLE INTERVAL
	DDD MM.MH	DDD MM.MH	DD/MM/YY	WEEKS	SECS
CADIZ	36 32.0N	6 17.0W	01/09/81	56	3600
TARIFA	36 0.0N	5 36.0W	01/09/81	56	3600
GIBRALTAR	36 8.0N	5 21.0W	01/09/81	56	3600
CEUTA	35 54.0N	5 19.0W	01/09/81	56	3600
ALGECIRAS	36 7.0N	5 26.0W	01/09/81	56	3600
PUERTOS BANUS	36 37.0N	4 55.0W		NO DATA	
MALAGA	36 43.0N	4 25.0W	01/09/81	56	3600
ALMERIA	36 49.7N	2 29.2W	14/08/81	58	3600
CARTEGENA	37 36.0N	0 59.0W		NO DATA	
ALICANTE I	38 20.3N	0 30.4W	23/08/81	60	3600
ALICANTE III	38 20.3N	0 30.7W	28/08/81	60	3600
PALMA DE MALLORCA	39 33.0N	2 38.0E	01/09/81	56	3600
BLANES	41 41.0N	2 48.0E		NO TIDE GAUGE	
ROSAS	42 15.0N	3 11.0E		NO TIDE GAUGE	
PORT VENDRES	42 31.0N	3 6.0E	28/12/81	39	3600
SETE	43 25.0N	3 43.0E		NO DATA	
FOS	43 25.0N	4 46.0E		NO DATA	
TOULON	43 7.0N	5 55.0E	30/08/81	56	3600
NICE	43 42.0N	7 16.0E	03/07/81	68	3600
MONACO	43 44.0N	7 25.0E	29/06/81	69	3600
OFFSHORE	42 34.8N	8 44.0E	06/04/82	18	1800
NEAR CALVI	42 34.8N	8 44.0E	29/07/82	9	1800
AJACCIO	41 55.0N	8 43.0E	30/08/81	49	3600
CAGLIARI	39 13.0N	9 8.0E		NO DATA	
SAVONA	44 18.0N	8 28.0E		NO DATA	
GENOVA	44 24.0N	8 54.0E	31/08/81	58	3600
LA SPEZIA	44 7.0N	9 48.0E		NO DATA	
LIVORNO	43 33.2N	10 18.2E	31/08/81	49	3600
CIVITAVECCHIA	42 5.7N	11 47.4E	25/08/81	22	3600
NAPOLI	40 50.4N	14 16.2E	31/08/81	56	3600
PALERMO	38 8.0N	13 23.0E		NO DATA	
ANCONA	43 37.0N	13 31.0E	01/09/81	56	3600
PTO CORSINI	44 35.0N	12 20.0E		NO DATA	
VENEZIA	45 26.0N	12 20.0E	01/01/81	104	3600
KOPER	45 33.0N	13 44.0E	28/02/82	9	3600
ROVINJ	45 5.0N	13 38.0E	28/02/82	9	3600
BAKAR	45 18.0N	14 32.0E	28/02/82	9	3600
ZADAR	44 5.4N	15 16.3E	28/02/82	9	3600
NOVALJA	44 33.3N	14 13.2E	28/02/82	9	3600
SPLIT	43 30.0N	16 26.0E	28/02/82	9	3600
DUBROVNIK	42 40.0N	18 4.0E	28/02/82	9	3600
BAR	42 5.0N	19 5.0E	28/02/82	9	3600

In compiling the dataset, MIAS translated all incoming data into a common format with elevation values standardized to meters and times to GMT. The data for each site were plotted as a time series and checks were carried out for gaps or constant values, spikes, spurious data or punching errors. Further checks were carried out by tidally analyzing and low pass filtering the data. Non-tidal fluctuations were investigated using principal component analysis. Qualifying information applicable to the data from each site was checked for inconsistencies and completeness, and appropriate documentation was stored with the data in the form of plain language records. The complete quality controlled dataset, including documentation, is available as a single magnetic tape formatted in GF3, the IOC's standard format for the exchange of oceanographic data. A copy of the magnetic tape may be obtained at a cost not to exceed the cost of reproduction and postage from:

World Data Center A, Oceanography
National Oceanic & Atmospheric Administration
Washington, D.C. 20235
U.S.A.

or

RNODC/MEDALPEX Sea Level Data
MIAS
Bidston Observatory
Merseyside L43 7RA
U.K.

TOGA

TROPICAL OCEAN and GLOBAL ATMOSPHERE PROGRAMME
TROPICAL SUBSURFACE DATA SET

TOGA Tropical Subsurface Data Centre

The TOGA Tropical Subsurface Data Centre in Brest operates within the framework of both the IOC's International Oceanographic Data Exchange (IODE) system and the Joint IOC-WMO Integrated Global Ocean Services System (IGOSS). The Centre collects subsurface ocean observations for the tropical oceans (30°N-30°S) from the following sources:

1. tropical oceans observations from the IGOSS network;

2. additional vertical temperature profiles from XBT's and from drifting or moored buoys with thermistor chains, not sent over the GTS;

3. time series of temperature and conductivity (salinity) at fixed depth from moored thermistor chains;

4. surface temperature and conductivity (salinity) data and vertical profiles of temperature and conductivity as from CTD's, bottle casts, and WCTD's; and

5. other subsurface ocean temperature and conductivity (salinity) measurements from process-oriented intensive oceanographic observation projects in the tropical oceans.

Initially, data are collected from radio transmissions, with fully digitized and quality controlled observations added with time.

The subsurface thermal data described above are analyzed and the Centre produces quality-controlled Level II-B data sets for the tropical oceans for the ten-year period (1985-1994). The Centre is also responsible for provision of these data sets on magnetic tape in GF-3 format to other TOGA Data Centres and to the World Data Centers, Oceanography at appropriate intervals.

WDC-A, Oceanography Support to TOGA

WDC-A, Oceanography serves as an archival center for the TOGA Tropical Subsurface Data Sets. Its responsibilities are to provide TOGA data sets to requesters in the international scientific community, at a cost not to exceed that of data reproduction and postage, and to provide copies of all TOGA data sets received to World Data Center B, Oceanography in exchange.

WDC-A, Oceanography provides additional data management support to the TOGA program by its contributions to the enhancement of global tropical thermal data bases. WDC-A has utilized the IOC's lists of Declared National Programs (DNP's) to identify selected cruises for which data were observed in the tropical oceans and, subsequently, requested the data. Report of Observations/Samples Collected by Oceanographic Programs (ROSCOP) marine data inventory forms have been used in the same manner to identify available tropical oceans data. The compilation of the Time Series Data Inventories of the world's oceans by WDC-A, has also resulted in some cases in the identification of available tropical ocean observations. WDC-A expects to utilize these tools increasingly in the future to acquire selected data sets intended to further enhance the tropical oceans data bases.

Climate researchers and modelling experts have identified the digitization of historical oceanographic observations as one of the key elements required in data management support for TOGA and other Global Change programs, such as GOFS and WOCE. Such data sets are frequently extremely useful in filling spatial or temporal gaps in existing digital data holdings. WDC-A, Oceanography's data archives contain data for a substantial number of observations in manuscript form that have never been processed. A significant portion of these could provide support to TOGA. For example, some Japan Fisheries Agency standard sections in the Western Pacific are in the TOGA area. Many of these manuscript data sets would be amenable to data entry by an optical scanning device. The possibility of support for procurement of such a device is being explored by WDC-A.

TOGA Tropical Subsurface Data Products

WDC-A receives Level II-B data sets from the Subsurface Data Centre in Brest for both Atlantic and Indian Oceans data, as previously described. Magnetic tape copies of the Level II-B data sets for the Atlantic and Indian Oceans are then provided to WDC-B, Oceanography in exchange. Magnetic tape copies of these data sets are available at the cost of tape reproduction from:

World Data Center A,
Oceanography
National Oceanic and
Atmospheric Administration
Washington, D.C. 20235 U.S.A.

TOGA Subsurface Data Centre
Centre IFREMER de Brest
BP 70
29263 Plouzane
France

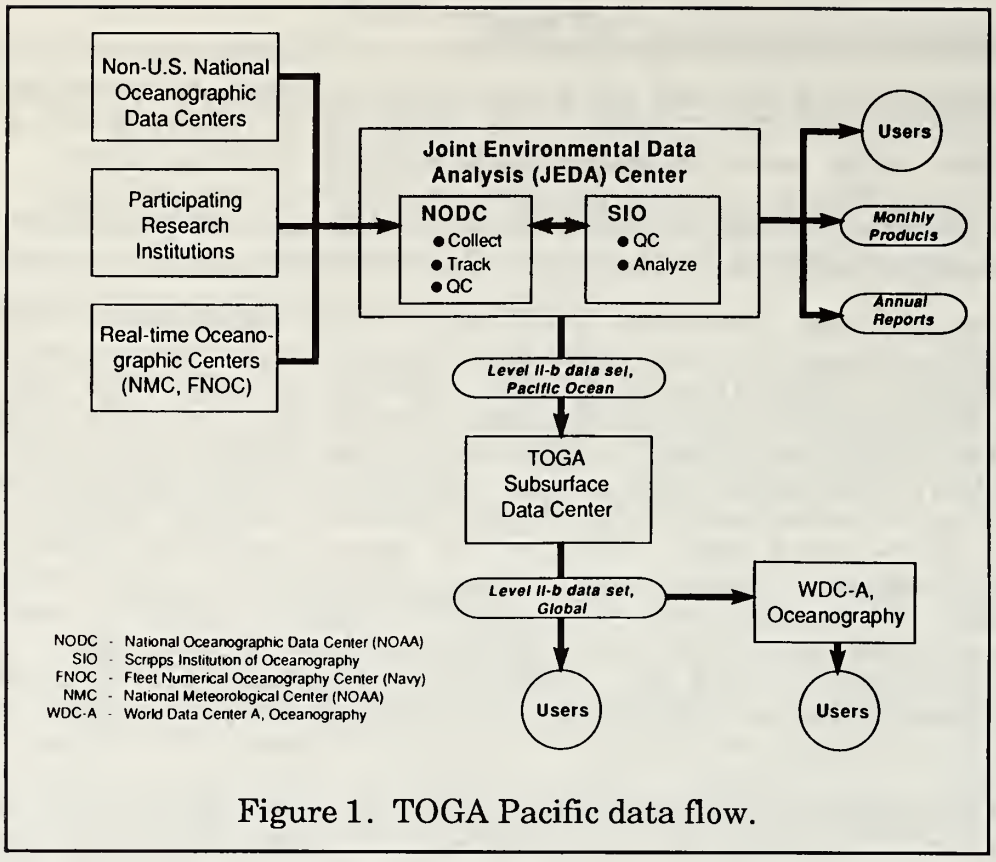


Figure 1. TOGA Pacific data flow.

WDC-A, by virtue of its collocation with the U.S. National Oceanographic Data Center (NODC), also has access to the Tropical Pacific Ocean data set prepared jointly by NODC and the Scripps Institution of Oceanography (SIO), serving as the Joint Environmental Data Analysis (JEDA) Center. JEDA tracks, acquires, quality controls, and merges all available subsurface thermal data for the Tropical Pacific. NODC assembles, reformats and initiates quality control of the data; SIO performs further quality control and analysis of the data. The TOGA Pacific data flow is depicted in Figure 1. Each yearly Level II-B Pacific Ocean data set undergoes the full spectrum of quality control and analysis by the JEDA Center. It is then converted to the GF-3 format and provided to WDC-A, which in turn provides a tape copy to WDC-B in exchange. The TOGA Pacific Data Sets are available on magnetic tape at the cost of tape reproduction from:

World Data Center-A, Oceanography
NOAA
Washington, D.C. 20235 U.S.A.

JEDA Center
National Oceanographic Data Center
NOAA
Washington, D.C. 20235 U.S.A

JEDA Center
Scripps Institution of Oceanography
University of California
La Jolla, CA 92093 U.S.A.

RNODC SOC

SOUTHERN OCEANS DATA SET

The RNODC/Southern Oceans (RNODC/SOC) was created in order to provide a regional data management and data information service for Southern Oceans physical and chemical oceanographic data. The RNODC was created under guidelines set forth in Recommendation XII.1 by the IOC's Technical Committee on International Oceanographic Data Exchange (IODE XII, Moscow 10-17 December 1986).

The Terms of Reference of the RNODC/SOC include the following responsibilities:

- Acquire, quality control, and store in standard format the physical and chemical data obtained by the international community from the cruises and research programmes carried out in the Southern Oceans;

- Co-operate closely with the World Data Centers, Oceanography by sending regular shipments (at least once a year), free of charge, of complete sets of physical and chemical data stored on magnetic tapes in GF3, and inventories, data summaries, and other data products related to the physical and chemical data from the Southern Oceans;

- Assist the World Data Centers by sending copies to them of any ROSCOP forms submitted to the RNODC-SOC;

- Co-operate with the BIOMASS Data Center, regarding exchange of data and inventories, as well as other data products.

The RNODC-SOC is located in and operated by the Argentine Oceanographic Data Center (CEADO).

RNODC/SOC Oceanographic Data Set

The RNODC/SOC data set contains data for all available oceanographic stations for the Southern Oceans between 50° and the Antarctic Continent. Data for a total of 10,869 oceanographic stations taken during 291 Southern Oceans cruises are included in the data set. Seasonally, the data totals are nearly 2,000 observations taken during the Austral Winter (April-September) and more than 8,000 observations taken during the Austral Summer (October-March). Southern Oceans observational data taken by 16 countries have been received by the RNODC.

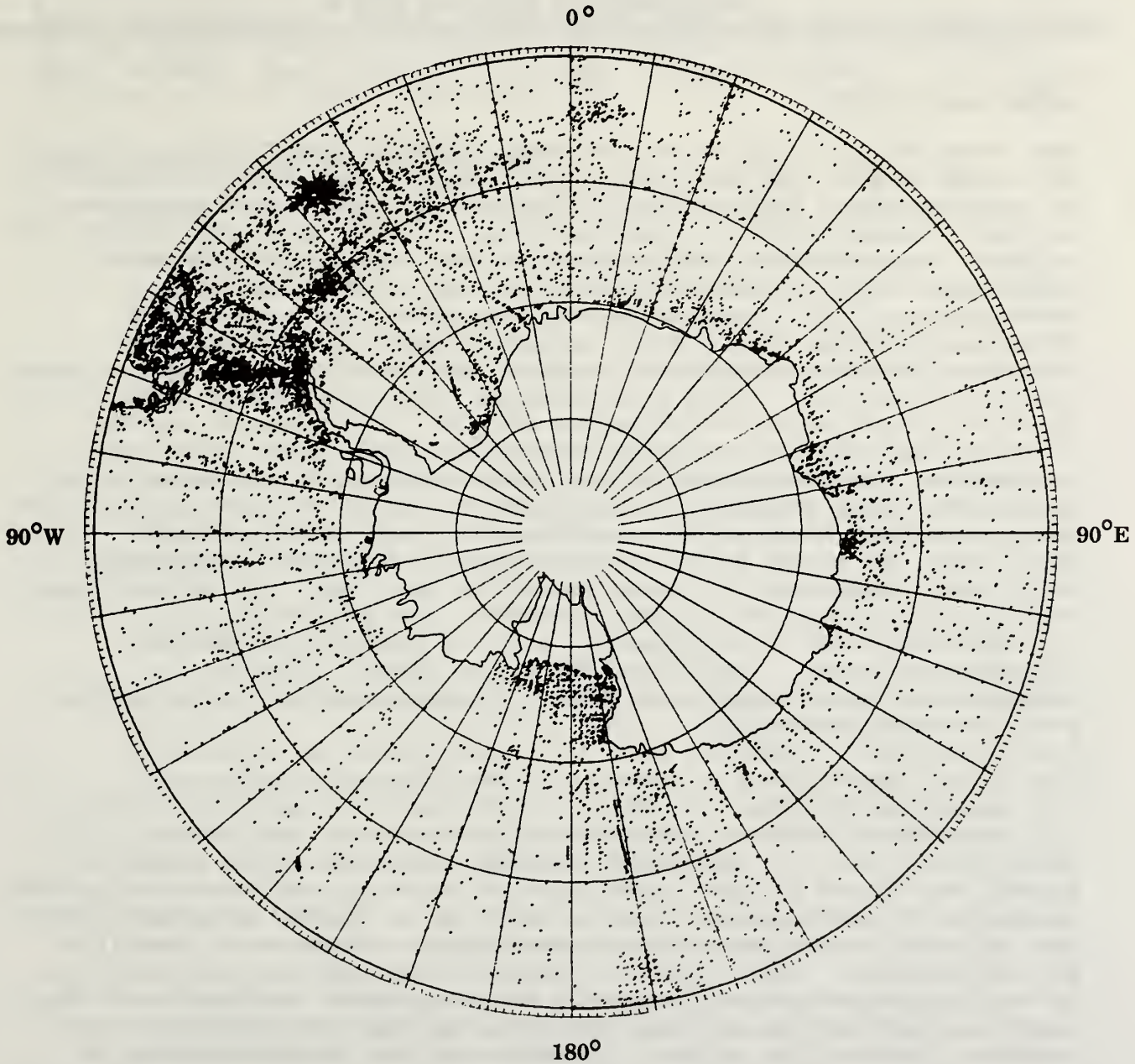
The RNODC/SOC data set is available from:

RNODC/SOC
Servicio de Hidrografia Naval (A.R.A.)
Centro Argentino de Datos Oceanograficos
Avda. Montes de Oca 2124
(1271) Buenos Aires
Republica Argentina

or

World Data Center A, Oceanography
National Oceanic & Atmospheric Administration
Washington, D.C. 20235 U.S.A.

SOUTHERN OCEANS
OCEANOGRAPHIC STATION PLOT



This plot shows the locations of 10,869 oceanographic data observations made in the Southern Oceans and registered in the RNODC/SOC master data file.

RNODC IGOSS

INTEGRATED GLOBAL OCEAN SERVICES SYSTEM DATA SET

IGOSS Background

The Integrated Global Ocean Services System (IGOSS) is a worldwide system for the rapid collection, exchange, and analysis of oceanographic data and the timely preparation and dissemination of ocean products and services. IGOSS was established to support oceanographic and meteorological research efforts by providing: (1) a global distribution of oceanographic observations, (2) a mechanism for the timely and effective exchange of data, and (3) the preparation of oceanographic analysis products capable of supporting global change and climate research studies. IGOSS products and services can be useful for input to large scale circulation models, for research survey planning, and for direct application in commercial fisheries, recreation, commercial shipping, and search and rescue efforts. Real-time ocean products currently available include sea surface and subsurface temperature analyses, as well as graphical depictions of mixed layer depths and ocean frontal positions. Additional analyses and data summaries available as delayed-mode products include: (1) ocean currents, (2) salinity, (3) distribution of pollutants, and (4) weekly and monthly temperature means. The IGOSS data are BATHY (profiles of temperature with depth) and TESAC (temperature/salinity/current profiles with depth).

The major operational elements of the IGOSS program are: (1) observing system, (2) data processing and services system, (3) telecommunication arrangements, (4) marine pollution monitoring, and (5) data archival and exchange. The organizational structure of the IGOSS data processing and services system consists of World Oceanographic Centers in Moscow and Washington and National and Specialized Oceanographic Centers in participating nations. Data from all cooperating nations are combined in standard formats at the World Oceanographic Centers, and then used as input to global and hemispheric analyses for improved weather forecasting, global climate studies, and a variety of products for oceanographic research uses. National Oceanographic Centers provide quality control for data from their country entering the international exchange system via a high speed global telecommunications link called the Global Telecommunication System (GTS) of the World Weather Watch.

IGOSS

Long-range data exchange and service arrangements and long-term archival functions for IGOSS data are performed by National Oceanographic Data Centers in Japan, the U.S.S.R., and the United States. These NODC's, serving as Responsible National Oceanographic Data Centers (RNODC's) for IGOSS, compile archives of IGOSS data and products, assume responsibilities for specified regions of the world oceans, and deal with problems of quality control. They maintain geographically sorted, updated magnetic tape files of observations received via the GTS.

RNODC's/IGOSS Terms of Reference

The terms of reference for RNODC's/IGOSS are as follows:

1. Acquire BATHY and TESAC datasets and sub-surface temperature data from drifting and moored buoys from IGOSS Specialized Oceanographic Centres (SOC) for area of responsibility; apply supplementary quality control to acquired data and provide services to users after 30 days from receipt of that data;

2. Acquire non-operational BATHY, TESAC, and sub-surface temperature data from drifting and moored buoys and/or datasets for area of responsibility; apply quality control to non-operational data, prepare integrated datasets, and provide services to users;

3. Maintain a data base and inventories for areas of responsibility;

4. Prepare products based on operational and non-operational IGOSS data, as appropriate; also, archive and make available to users, selected data products provided by SOCs and analysis centres;

5. Provide for exchange of IGOSS data in GF-3 format with other RNODC's or to users as requested;

6. Transmit datasets in GF-3 format, inventories of archived data, and selected data products to the WDC's annually;

7. Provide for exchange of documentation and software regarding quality control and processing procedures with other RNODC's, as possible;

8. Participate in efforts to monitor data flow, and participate, as feasible, in IOC training programmes;

9. Prepare inventories of available data sets for the RNODC's area of interest and transmit them to the IOC Secretariat semiannually.

RNODC/IGOSS-Japan

The RNODC/IGOSS-Japan is operated by the Japan Oceanographic Data Center (JODC), with support from the Japan Meteorological Agency (JMA), which serves as a Specialized Oceanographic Center (SOC) for IGOSS. At the SOC, systematic quality control of the collected BATHY/TESAC reports is made. The SOC compiles the IGOSS monthly summaries including maps showing the geographical distribution of BATHY/TESAC messages and numbers of messages of individual ships and sends them to the Secretariat of the IOC.

IGOSS data submitted by the SOC are stored in three formats at the RNODC/IGOSS. The first includes the original data file compiled on a semiannual basis. This file contains the collected and processed data from the GTS and other operational sources within the area of responsibility. The second contains the data and data inventory files recorded in a form of the SYNDARC Format, and is available to users as computer-generated data summaries, statistical presentations, and graphical plots, or in a medium which allows the user to further process the data using a personal computer. During the conversion process, minimum quality control procedures are applied to the original data based on IOC Manuals and Guides No. 3. The third is the JODC-formatted version of the data inventory file. From this file, data products such as data summaries and location plots of observations are provided to users, as well as to the IOC and WMO.

RNODC/IGOSS-U.S.S.R.

The RNODC/IGOSS-U.S.S.R. and SOC for IGOSS data was established in 1984 under the auspices of the All-Union Scientific Research Center for Hydrometeorological Information and Hydrometeorological Scientific Research Center of the USSR (Hydrometcentre USSR). The responsibilities of the RNODC/IGOSS include the collection of BATHY/TESAC messages and logs, quality control of the data, preparation of data sets on magnetic tape, and the development of products concerning availability and time-space data distribution. The RNODC/IGOSS also provides national and international users with copies of data, results of analyses, and with other products for its area of responsibility.

The responsibilities of the SOC include preparation, publication, and distribution of different types of operational oceanographic products on a regular basis including those distributed via FAX machines that are readily available to different groups of users.

These activities are carried out in accordance with the procedures spelled out in the IOC's Guide to Operational Procedures for the Collection and Exchange of Oceanographic Data (BATHY and TESAC), 1985 and the Guide to the IGOSS Data Processing and Services System, 1983.

RNODC/IGOSS-U.S.

The RNODC/IGOSS-U.S., located at the National Oceanographic Data Center (NODC), receives near real-time data weekly from the Ocean Products Center at Suitland, Maryland and the Ocean Applications Group in Monterey, California. These data are extracted from the Global Telecommunications System (GTS) on a daily basis for screening and editing. At the RNODC, the magnetic tapes containing the near real-time data sent by the two organizations are run through a series of computer programs to convert the data into NODC's Universal Bathythermograph (UBT) format. This data set is next sorted by date, time, position, and an indicator of the source of the data. The sorted file is then compared with existing observations and duplicates are eliminated.

The records retained are then sorted by reference number, date, and time to produce a cruise-ordered data set. From this final data set, inventory records are created and applied to NODC's Data Inventory Data Base (DINDB). These data are then merged into the RNODC/IGOSS Archive. The Archive is updated on a monthly basis in geographical sequence.

Data in the U.S. RNODC/IGOSS Archive are then available for international exchange and can be provided to users in a variety of forms ranging from magnetic tape copies to computer-generated data summaries, statistical analyses, and graphic plots.

Availability of IGOSS Data and Products through WDC A, Oceanography

Various RNODC/IGOSS data, analyses, and products are available through WDC-A, Oceanography. Upon request, WDC-A will provide magnetic tape copies of pertinent data products, or, alternatively, refer the requester to the appropriate IGOSS data source.

RNODC FOR DRIFTING BUOYS

Background

The Marine Environmental Data Service (MEDS) began operation of the RNODC/Drifting Buoy Data in January 1986. The RNODC acquires Drifting Buoy Data from worldwide sources, makes the data available to international scientific programs, and prepares geographical plots of Drifting Buoy locations and tracks for the world oceans on a monthly basis. The RNODC also provides monthly statistics of operational buoys and the number of messages received from them.

Acquisition of Drifting Buoy Data

There are three procedures by which Drifting Buoy Data are received by the RNODC. The first and more traditional is for the principal investigator to submit his data directly to the RNODC, or to his National Oceanographic Data Centre which in turn submits the data to the RNODC. For historical data sets, this is the only option available. Data received in this way are usually of the highest quality, since they have undergone the most discriminating calibration and quality control procedures under the direction of the principal investigator; however, data entering the system in this manner are not sufficiently timely to meet the operational requirements of the major global science programs.

The second path for data flow to the RNODC is via the GTS. An advantage of this procedure is that the data are available in time scales suitable for the operational requirements of researchers in programs such as TOGA and WOCE, as well as for other operational users such as meteorological forecasters. Data received in this way may be less accurate, because they have not been fully reviewed and assessed by the principal investigator. For drifting buoy data, there is also a problem in that using the DRIBU format on the GTS for some buoys may limit the data that can be transmitted, because of a requirement to restrict the information to 256 bits.

A third procedure involves retrieving the DRIBU data as they pass through Services ARGOS. Although these data still have not been reviewed and assessed by the principal investigator, they are an improvement over the GTS data in that both time of data and time of position are available to improve velocity calculations. Data received by Service ARGOS are stored on magnetic tape for a period of 90 days. After this time, the tapes are reused and the data then reside solely in the hands of the principal investigators. Canada and the United States have

agreed to share the cost of buying copies of these tapes for the RNODC. Data from a buoy can only be provided to the RNODC if the principal investigator has given consent in writing.

RNODC/Drifting Buoy Data Base

MEDS utilizes a hierarchical database, called System 2000, to store the drifting buoy data; because of the volume of data, each year of data is stored in its own data base. In order to provide services to users at all time scales and to have available at each time scale the best data available, the RNODC has decided to accept all data using the following hierarchical guidelines:

1. Where possible, Principal Investigators are requested to make their data available to other operational users and to the RNODC by having the data transmitted on the GTS. The RNODC will copy all available data from the GTS, quality control it, and update it into the data base on a weekly basis.

2. Principal Investigators are also requested to agree to have Service ARGOS provide a copy of their data to MEDS via tape each month whether or not those data have already been on the GTS. The data circulated on the GTS have only the one time included which poses a difficulty in calculating velocities. Thus, the tape data with the two times is an improvement to the database and will be used to replace the GTS data in the database. In addition, data will be picked up which could not be circulated on the GTS because of the format of the transmission from the buoy.

   If Service Argos has not already been supplied with the calibration constants, channel allocations, and algorithms, or has not been requested to make the conversions to physical units, there will be a requirement for the RNODC to obtain this information from the principal investigators. Principal investigators are reminded that if the sensor data cannot be made available, the position data itself is of value for the database.

3. Principal Investigators are requested to provide a copy of their Drifting Buoy Data either directly to the RNODC when the fully processed, quality controlled version is available, or to provide the data to their National Oceanographic Data Centre, where the RNODC will be requesting such data on a regular basis. Data received by this path will replace GTS or Service ARGOS versions of the data in the database.

By receiving data in the configuration set forth above, and replacing earlier, lower quality data as higher quality versions of the data arrive, the RNODC can offer

users a choice between timeliness and quality, as dictated by their particular requirements.

The RNODC recognizes that in some cases there exists a need to restrict distribution of data to protect a scientist's right to benefit first from collection activities carried out at a considerable effort and cost. It is noted that the large international experiments generally have data exchange agreements that state when the data are available to other partici-pants and to those outside the program. The RNODC will honor such data exchange agreements and will, at a scientist's request, restrict further distribution of the data according to the terms of the pertinent agreement. In regard to data from individual scientists, bilateral agreements on further distribution of data for a period of up to two years can also be made, if necessary.

RNODC Services

As mentioned earlier, the RNODC maintains its drifting buoy in a data base structure. This provides maximum flexibility when meeting a request. While a number of different qualifiers may be used to retrieve data, the most common are area and time. Requesters may also specify all data or only those which have passed the quality control procedures. On output, the data can be written to magnetic tape in a standard subset of the GF3 formatting system or in some other agreed ad hoc character format if appropriate. In choosing the data format users should be aware that the GF3 Formatting System is supported by a powerful and growing software system which is available for many of the more widely used host computers.

Each month, the RNODC publishes a summary of the data it has received in real time; also produced are global maps of drifting buoy tracks for the previous month. These maps are issued regularly on a monthly basis. Anyone wishing to receive this summary, should contact the RNODC. There is no charge to receive this product.

To obtain the RNODC Drifting Buoy Data Set, requesters should contact one of the following:

RNODC for Drifting Buoy Data
Marine Environmental Data Service
Department of Fisheries and Oceans
200 Kent Street
Ottawa K1A 0E6 Canada

Telephone: 613-990-0268
Telex: 053-4428
Telemail: RNODC.DRIBU (Omnet)

World Data Center A,
Oceanography
NOAA
Washington, D.C. 20235 U.S.A.

Telephone: 202-606-4571
FTS-266-4571
Telemail: NODC.WDCA (Omnet)

TOGA

TROPICAL OCEAN and GLOBAL ATMOSPHERE PROGRAMME SEA LEVEL DATA SET

TOGA Background

A major component of the TOGA International Implementation Plan is the monitoring of the global atmosphere and the upper layers of the three tropical oceans during the ten-year period of 1985-1994. Existing meteorological and oceanographic observation systems have been maintained and expanded by TOGA while new networks have been installed in key locations. These observations along with available historical data will provide a description of the ocean-climate system and its variability from sub-seasonal to interannual scales.

TOGA Sea Level Center

The TOGA Project, realizing the importance of sea level data for reasearch in ocean dynamics and for the monitoring and prediction of oceanographic processes, has established a TOGA Sea Level Center at the University of Hawaii. It is the purpose of the Center to collect all sea level data taken by island-based and coastal tide gauges in the TOGA area between 30°N and 30°S during the ten years of the TOGA project, 1985 to 1994, and to make them available for research. The TOGA Sea Level Center also obtains and archives past sea level data for the same region, when they are made available from the originators. Hourly, daily, and monthly values are prepared and archived, the data are stored digitally on magnetic tape, and are passed on yearly to other TOGA data centers, to the Permanent Service for Mean Sea Level (PSMSL), and to the World Data Centers A, B, and D for Oceanography. The TOGA Sea Level Center also supports the Global Sea Level Observing System (GLOSS). The importance of sea level data has been enhanced by the need for calibration of satellite altimeters such as GEOSAT, and for the TOPEX mission planned for WOCE.

Joint Archive for Sea Level (JASL)

Through the creation of the Joint Archive for Sea Level (JASL) with the University of Hawaii, the National Oceanographic Data Center, serving as a Specialized Data Center, is providing data management for this effort and assisting in the acquisition, processing, quality assurance, archiving, and dissemination of the data. The Joint Archive for Sea Level submits sea level time series data updates to NODC on a yearly basis. These updates may include data from new stations, as well as previously unprocessed data from existing stations. In addition, the updates may include data previously submitted to NODC that have been reprocessed to improve data quality. Therefore, to update the sea level data files for a station already in the database, NODC completely replaces the data time series for that station with a new version that may include both new and reprocessed data.

Availability of JASL Data through WDC-A, Oceanography

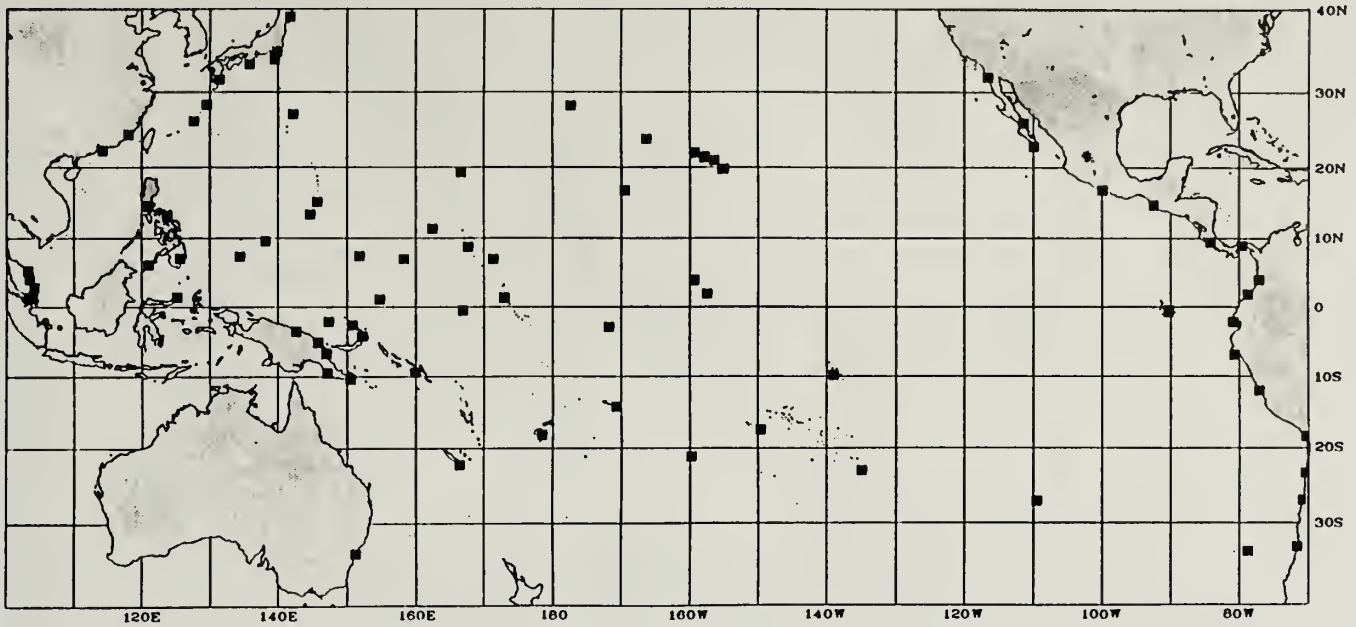
NODC maintains the JASL permanent archive of sea level data in three archive data files that contain hourly data, daily data, and monthly data. Data for selected stations can be retrieved from these data files and provided to customers on magnetic tape or - for small data volumes - on a floppy disk at prices determined by data volume and output medium.

The JASL data set is available from:

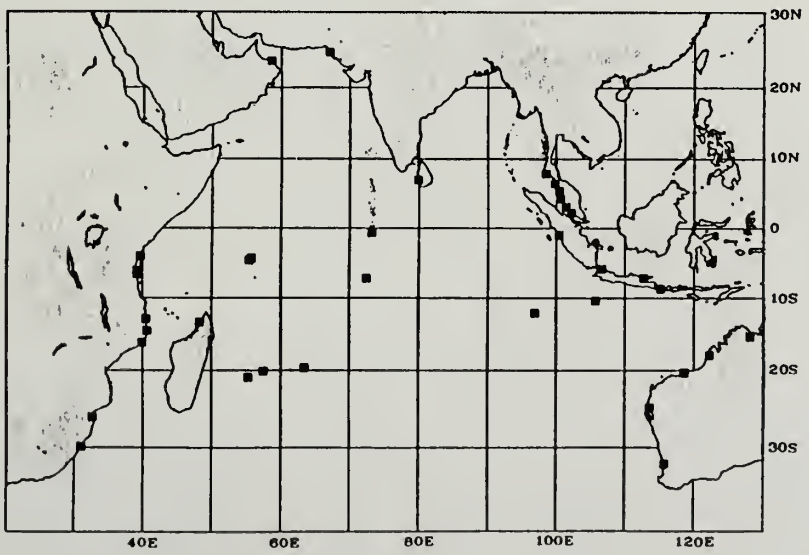
World Data Center A, Oceanography
National Oceanic and Atmospheric Administration
Washington, D.C. 20235 U.S.A.

Certain stations may have unresolved problems. These data are retained at the TOGA Sea Level Center and may be obtained on a case-by-case basis. For these data and for questions concerning data preparation contact:

The Joint Archive for Sea Level
c/o The TOGA Sea Level Center
University of Hawaii
1000 Pope Rd. MSB 417
Honolulu, Hawaii 96822 U.S.A.



Pacific Ocean sea-level stations with quality-controlled data in the JASL archive



Indian Ocean sea-level stations with quality-controlled data in the JASL srchive

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